

# Why Did Gender Wage Convergence in the United States Stall? \*

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## Abstract

During the 1980s, the wage gap between white women and white men in the US declined by approximately 1 percentage point per year. In the decades since, the rate of gender wage convergence has stalled to less than one-fourth of its previous value. An outstanding puzzle in economics is “what caused gender wage convergence to stall?” Using an event study design that exploits the timing of state and federal family-leave policies, we show that the introduction of the policies can explain 84% of the observed reduction in the rate of gender wage convergence. If gender wage convergence had continued at the pre-family leave rate, wage parity between white women and white men would have been achieved as early as 2017.

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*Keywords:* Gender Wage Gap, Family and Medical Leave Act, Family Leave.

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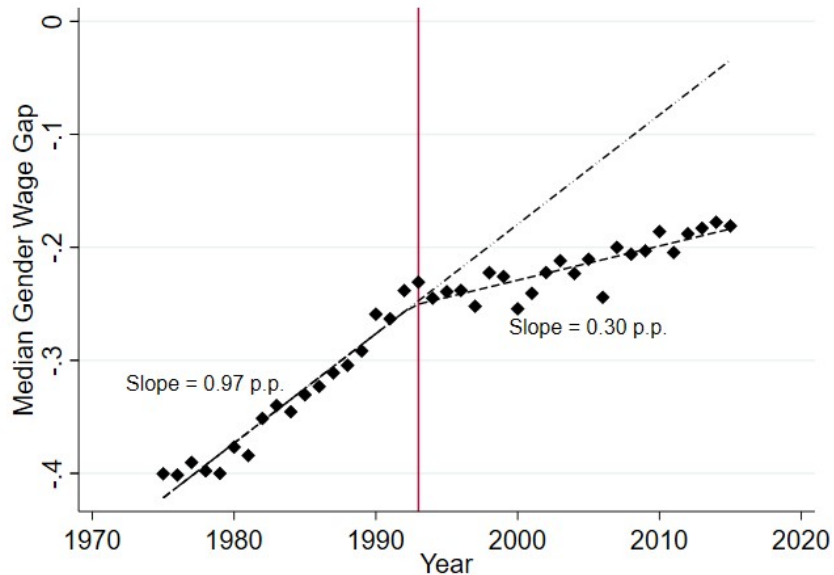
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# 1 Introduction

Women entering the workforce en masse is one of the most important developments in the US labor market during the past century (Goldin, 2014). While female labor force participation increased following WWII, the gender wage gap held steady at 40% (Blau and Kahn, 2000). The 1980s, however, marked a time of steady gains for women, with the gender wage gap closing by roughly 10 percentage points, as shown in Figure 1. The 1990s and beyond, however, were marked by a return to a stagnation in gender wage convergence. The ratio of women’s earnings to men’s earnings increased by a mere 2 percentage points in the 20 years between 1990 to 2010 (Fortin and Lemieux 2000; Blau and Kahn 2000, 2006, 2017; Maasoumi and Wang 2019). While the reasons for gender wage convergence during the 1980s are well-understood—namely declining unionization, a reduction in gender discrimination, and reduced gender gaps in education, labor market experience, and occupational sorting—the pattern of stagnant wage gains for women in the 1990s remains a puzzle (Blau and Kahn 2000, 2006, 2017; Kleven 2022). As stated by Henrik Kleven: “the literature has discussed a variety of explanations for this puzzle, but conclusive evidence has been elusive” (Kleven, 2022). We show that the introduction of state and federal family-leave policies can explain why gender wage convergence in the United States stalled.

Figure 1: Median Gender Wage Gap (1975-2015)



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. For each year from 1975-2015 we use the Current Population Survey to calculate the median difference in the wages of women and men as a fraction of the median earnings of men. Starting in 1975, the gender wage gap is 40% – women earn 60 cents on the dollar when compared to men. From 1980 to 1993, the gender wage gap falls from 40% to 22%, which translates into an annual reduction in the gender wage gap of 1.4 percentage points per year. We project out the rate of gender wage convergence from the 1980s in the dashed line.

In 1993, US President William Jefferson Clinton signed into law the Family and Medical Leave Act (FMLA), which guarantees 12 weeks of unpaid, job-protected leave to qualified workers for covered family or medical circumstances.<sup>1</sup> Waldfogel (1999) shows that the FMLA is effective at increasing family-leave coverage for employees. Despite the fact that the FMLA does not require firms to pay workers during their leave, it may impose costs on employers whose workers take leave under the FMLA. For 58% of employees on FMLA leave, work loads are shifted to another employee, while 6% of employees on FMLA leave are replaced by temporary workers (Brown et al., 2020).<sup>2</sup> Although the FMLA is a gender-neutral policy, women are more likely to file an FMLA claim; moreover, conditional on taking FMLA leave, the duration of leave spells are on average 14 business days longer for women than for men (Tompson 1997; Waldfogel 1999, 2001; Brown et al. 2020). Given the cost of employee leave taking to firms and the differential use of the FMLA by women, it is plausible that the introduction of family-leave policies could have differential impacts on wages by gender.

There is a growing body of evidence documenting the negative causal impacts of leave policies on women's relative progress in the labor market. For example, Antecol et al. (2018) find that gender-neutral, tenure clock-stoppage policies in academia decrease female tenure rates in economics departments while increasing male tenure rates. National and state-specific studies in the US and Europe of family-leave policies document similar facts. For instance, Thomas (2016) shows the FMLA lowered female promotion rates by 8 percentage points despite increasing the likelihood of employment for women by 5 percentage points. Moreover, Bailey et al. (2019) found that California's paid family-leave policy reduced long-term wages for mothers, with first-time mothers experiencing the sharpest declines. Extensions in paid leave in Sweden likewise increased the gender wage gap (Ginja et al., 2020).

Both the increased scholarship demonstrating the unintended effects of family-leave policies and the descriptive fact that gender wage convergence stagnated around the same time as the passage of the FMLA makes it conceivable that the introduction of the FMLA could explain the puzzle of gender wage stagnation during the 1990s in the United States. Pinpointing the introduction of family-leave policies as the cause of gender wage stagnation during the 1990s is challenging, however, because there are contemporaneous changes in other federal policies that could also affect wages and the gender wage gap.

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<sup>1</sup>To qualify for coverage, employees must have worked for their employer for at least one year and worked 1,250 hours in the past year.

<sup>2</sup>Other responses include: "put the work on hold until the employee returns" (13%), "employee performs some work while on leave" (3%), "hire a permanent replacement" (1%), "call in an employee on vacation" (0%), and "cover work some other way" (19%) (Brown et al., 2020).

The Earned Income Tax Credit (EITC), for example, was reformed in 1993, the same year as the FMLA was passed. Welfare reform at the federal level, which created the Temporary Assistance for Needy Families (TANF) program, is passed in 1996, 3 years following the passage of the FMLA.

To overcome the potential policy endogeneity deriving from just the federal variation in the introduction of unpaid family leave in the US, we leverage the fact that 12 states and the District of Columbia enacted antecedents to the FMLA during the years 1972–1992 that offered unpaid maternity leave. We use a stacked event study design applied to only the states and Washington, D.C. which passed family-leave policies prior to the FMLA. The event study allows us to exploit the state variation in the timing of family-leave policies that occurred prior to the FMLA. Using wage and demographic data from the Current Population Survey, in the decade before a state family-leave policy is passed, the gender wage gap between white women and white men closed at a rate of 0.75 percentage points per year (standard error of 0.10 percentage points). In the decade after a state family-leave policy is passed, the rate of gender wage convergence drops by 0.61 percentage points (standard error of 0.14 percentage points), or 81% of its pre-leave value. Consequently, the post-leave rate of gender wage convergence stalls at 0.14 percentage points (standard error of 0.10 percentage points) per year.

By focusing on state variation in family-leave policies that pre-dated the FMLA, we can avoid the effects of confounding federal policies to show that the introduction of family-leave laws contributed to the stagnation in the rate of gender wage convergence for white women in the US. Moreover, the antecedents to the FMLA are passed in the 1980s, which is a period of gender wage convergence in the US. Finding a pattern of stalling convergence during the period is further evidence that family-leave policies caused stagnation in the gender wage gap. Moreover, we document that convergence in certain states' gender wage gaps begins during the 1980s, before the passage of the FMLA, foreshadowing the better-known stagnation of the 1990s.

Next, we expand our event study approach to incorporate all 50 states and the District of Columbia. For states with a leave-policy prior to the FMLA, we maintain the previously-assigned event years. For the 38 other states, we assign 1993 as the event year that a family-leave policy is introduced. To control for state-specific waivers to the welfare system and the federal welfare reform in 1997 in the national event study, we follow the approach in [Kleven \(2019\)](#). When we leverage variation in the timing of leave policies across all states, we recover very similar estimates to the estimates obtained using only the state-specific policies passed prior to the FMLA. Based on our event study estimates, in the decade before a family-leave policy is passed, the gender wage gap between white

women and white men closed at a rate of 0.71 percentage points per year (standard error of 0.08 percentage points). In the decade after a family-leave policy is passed, the rate of gender wage convergence drops by 0.65 percentage points (standard error of 0.12 percentage points), or 92% of its pre-leave value. Consequently, the post-leave rate of gender wage convergence stalls at 0.07 percentage points (standard error of 0.09 percentage points) per year. By leveraging state and federal variation in leave policies, we obtain more precise estimates of the rate of gender wage convergence.

The introduction of family-leave policies reduced the rate of gender wage convergence by 81%–92%. To understand whether the decline is due to a change in observable or unobservable factors, we decompose the change in the gender wage gap before and after the passage of the FMLA using the methodology developed in [Juhn et al. \(1993\)](#), [Blau and Kahn \(2000\)](#), and [Blau and Kahn \(2006\)](#). We find that the convergence in the gender wage gap due to observed factors is 2.7 percentage points before the FMLA and 7.8 percentage points after the FMLA. Therefore, stagnation after the passage of the FMLA is not due to observable factors. However, the convergence due to the “Gap Effect,” which captures unobserved skills of workers as well as discrimination, is 18.6 percentage points before the FMLA and only 1.5 percentage points after the FMLA. Therefore, stagnation is due to the “Gap Effect.” Our estimates can explain 84% of the decline in the “Gap Effect.”

Using an event study for the full sample of states on the level of wages, we identify how family-leave policies affected wages and led gender wage convergence to stall. In the decade prior to the passage of a family-leave policy, wages for white men were stagnant. After the passage of a family-leave policy, however, wages for white men increased to levels that are nearly \$1.50 per hour higher. On the other hand, after the policy, women’s wages continued to grow at nearly the same annualized rate compared to before the policy. Consequently, convergence prior to the passage of a family-leave policy is due to the growth in the wages paid to white women, and stagnation in gender wage convergence after the passage of a family-leave policy is caused by an increase in wages paid to white men, not a decrease in the wages paid to white women.

By exploring heterogeneity in the impact of family-leave policies on wage levels by educational attainment, we show that the EITC expansion and welfare reform do not confound the causal impacts of family-leave policies on the stagnation of gender wage convergence. We can and do control for welfare reform in the event-study specifications, but, because the EITC is reformed nationally in 1993, the same year the FMLA is passed, we cannot control for it directly. If the federal EITC expansion or welfare reform were causing the stagnation in the gender wage gap, we would expect to see larger increases in wages occurring for white men with less than a college degree because they are more

likely to qualify for the programs than white men with at least a college degree. We find the opposite is true—the larger increase occurs for white men with at least a college degree. Therefore, neither the EITC nor welfare reform is responsible for the stagnation of the gender wage gap.

We conduct a heterogeneity test on subsamples of the data, including parental status (parents vs. childless). We subset the data by parental status and conduct the event studies separately for workers with children and workers without children to obtain gender wage gaps within the groups. At the time of passage, white women with children face a gender wage gap which is about 15 percentage points larger than the gender wage gap for white women without children. Prior to the passage of family-leave policies, white women with children also experience a rate of gender wage convergence that is greater than the convergence for white women without children by a statistically significant 0.304 percentage points per year. However, after the policy, there is a statistically significant reduction in the difference in the rate of gender wage convergence between white women with and without children. We show that family-leave policies stagnate the relative wage convergence between white women with and without children in addition to the stagnation in the gender wage gap between white men and white women.

Having shown that family-leave policies caused the stagnation in the gender wage gap, increased the wages of men, and caused stagnation in the relative wage convergence between white women with children and without, we now examine the value of the absolute effects of family-leave policies on annual wages using a back of the envelope calculation. We use the event-study point estimates to evaluate the differences between observed and counterfactual earnings for workers who work 2,000 hours per year (40 hours per week for 50 weeks). The year after a family-leave policy is passed, white women’s earnings increase by \$459 and white men’s earnings increase by slightly less (\$296), although the difference is not statistically significant. In the ten years after the passage of the policy, white women’s observed earnings are not statistically different than what their earnings would have been without a leave policy. On the other hand, during the decade following the passage of a leave policy, the earnings for white men increase almost monotonically relative to the counterfactual. One decade after the policy, we find that the earnings of white men increase by \$2,856 and the earnings of white women are not statistically different from the counterfactual (-\$195).

Our results provide causal evidence that the introduction of family-leave policies can resolve an important puzzle in economics: “why did gender wage convergence in the United States stall?” Further, we calculate that in the absence of family-leave policies gender-wage parity for white women would have occurred in 2017.

## 2 Literature Review

The study of gender wage gaps draws upon literature in labor economics, economic history, behavioral economics, public economics, and macroeconomics. Understanding the labor market frictions faced by women deepens our understanding of how the labor market functions. Understanding why gender wage convergence stalled in the United States in the 1990s is important for completing the picture of women's progress in the labor market and understanding the remaining barriers faced by women to achieving labor market equality.

Claudia Goldin (2021) describes the experience of women in the US labor market as consisting of 5 distinct "groups", with each group becoming more active in the labor market than the prior. Throughout all of the groups, women have faced a gender wage gap. In an extensive list of papers including a recent literature review, Blau, Khan, and co-authors document changes over time in the gender wage gap and its causes (Blau and Kahn 2000, 2006, 2007; Blau et al. 2013a,b; Blau and Kahn 2017). Because the stagnation of the residual gender wage gap during the 1990s is not being driven by differences in observables, or prices of observables, but rather differences in unobservables, there is a focus on alternative explanations. Recently, there is an increased focus on the extent to which gender differences in demand for labor market flexibility can explain gender gaps (Pitts 2003; Goldin 2014; Mas and Pallais 2017). Data on Uber drivers has shown that flexible work schedules provide increased surplus to workers compared to traditional work schedules (Chen et al., 2019) and the flexibility can help to explain the gender wage gap (Cook et al., 2018b). Behavioral economists, likewise, have extensively studied the extent to which gender difference in competition contributes to differences in occupational sorting and ultimately gender wage gaps (Niederle and Vesterlund, 2011). While the new literature has shown that gender differences in the demand for flexibility explains the residual gender gap in wages, "why did gender wage convergence in the United States stall?" is still an open question.

Several explanations for the stagnation have been offered to date, including changes in the occupational distribution, growth of the service sector, stagnation of labor force participation rates, increases in overwork, and stagnation of the "mommy penalty". During the 1990s, convergence in the occupational distribution between the genders stagnated (Blau et al. 2013a,b). At the same time, Olivetti and Petrongolo (2016) show that the growth of the service sector in the US, where women have a comparative advantage to men, coincidentally stagnated during the 1990s compared to prior decades. Meanwhile, growth in labor force participation rates for women in the United States weakened relative to other

OECD countries (Blau and Kahn, 2013). Cha and Weeden (2014) show that there has been little to no convergence in overwork, working more than 50 hours a week, and prevalence of overwork among men has increased the gender wage gap by 10 percent. Kleven (2022) proposes that a stagnation in the decline of the “mommy penalty” occurred in the United States during the 1990s.

While there is an extant literature on why gender wage gaps in the 1990s occurred, the literature cannot fully explain the cause. First, based on our calculations from a decomposition of the gender wage gap, changes in observable characteristics and market prices cannot explain the stagnation. In fact, convergence due to observable factors increase after 1993. Second, the explanations of the unobservable factors, such as the mommy penalty, are incomplete. Given that the mommy penalty stagnates in the 1990s, a natural question is: what causes the mommy penalty to stagnate?

We propose a new solution to the puzzle of why gender wage gaps stalled—the introduction of family-leave policies, which can explain 84% of the stagnation which is unaccounted for with observable characteristics. There are reasons to expect family-leave policies to have a differential impact on male and female earnings. Prior work has shown that women may carry the responsibility of caring for newborns and sick family members more than men (Goldin 2014; Cortés and Pan 2019; Trajkovski 2019; Page et al. 2016). Moreover, the literature on the effects of pregnancy points to worse labor-market outcomes for mothers (Kuziemko et al. 2018; Kleven et al. 2019; Kleven 2022). The negative outcomes exist even among highly educated women. Bertrand et al. (2010), for example, find that female MBA graduates from Chicago’s Booth School had lower labor force participation ten years after graduation, which was driven by changes after the birth of children. Juhn and McCue (2016) also documents that, while the marriage penalty for women has abated, there is still a significant negative wage impact for married women with a child. There is also evidence that scientific advances which allowed women to delay pregnancy led to changes in labor-market outcomes (Goldin and Katz 2000, 2002; Bailey et al. 2012). The end result is an expansion of the gender wage gap over the course of a worker’s career (Bertrand et al. 2010; Noonan et al. 2005)

Other areas of public economics show that policies targeting a specific group of workers have unintended consequences, even at the expense of the workers the policy was meant to protect. For instance, evidence suggests that regulations designed to protect disabled workers may decrease their labor-market outcomes (Acemoglu and Angrist, 2001). There is also growing work that examines the gender-specific impact of family-leave policies in the labor market (see Waldfogel 1999; Trajkovski 2019; Patnaik 2019; Bailey et al. 2019; Balser 2020; Albanesi et al. 2022). Gruber (1994) finds that firms shifted the costs of

state and federally-mandated increases in maternity-based insurance coverage during the 1970s to women’s wages, but did not decrease their labor input. Our paper builds on the literature studying state and federal mandates by showing the introduction of mandated family-leave policies caused gender wage convergence in the United States to stall.

While the FMLA has been extensively studied, it has not been directly implicated in the puzzle at the heart of this paper (Waldfoegel 1999, 2001; Thomas 2016; Brown et al. 2020). Our finding of a decline in the rate of gender wage convergence is congruent with the finding of Thomas (2016) that following the FMLA women were promoted at lower rates than before, which predicts a decrease in wage growth, if promotions are accompanied by raises. Waldfoegel (1999) has shown using a DiD strategy that the passage of the FMLA did not negatively affect women’s wages in the year immediately after its passage, a finding that we confirm. We generalize the findings of Waldfoegel (1999) by extending our sample period 22 years after the passage of the FMLA to measure the long-run impact of the FMLA on the rate of gender wage convergence. Therefore, we show that while family-leave policies did not immediately change the level of women’s wages, it affects the rate of progression of women’s wages relative to men in the long run, similar to the negative effect on the growth of employment due to the minimum wage shown by Meer and West (2016).

### 3 Data and Description of Gender Wage Stagnation

For our analysis, we use the Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS) available from IPUMS for the sample period 1976–2016 (Flood et al., 2020). Because many of the economic questions refer to the year prior, such as wage income last year, we relabel the year variables to correspond to a sample period of 1975–2015. Further, we restrict our sample to individuals aged 18–65 during the year the income was earned. We also only include workers who reported working at least 35 hours per week during a usual work week and had positive earnings for the prior year in order to create a sample of full-time workers. Finally, we only include workers who are white or black. Our final sample has 2,459,162 observations.

Using the ASEC, we construct several variables for our analysis. The first is a real hourly wage variable. The ASEC does not report hourly wages directly. However, an imputed hourly wage is obtained by dividing annual earnings by the product of hours worked per week and weeks worked last year. We then adjust for inflation using the CPI for all items for urban consumers in the US to create the real hourly imputed wage using 2000 as our base year (U.S. Bureau of Labor Statistics, 2019). Due to the creation of the

hourly wage variable from imprecise inputs, we winsorize the wage data to the middle 99% of the distribution to handle extreme values.<sup>3</sup> We also create an indicator variable for full-year workers equal to one if the worker reported working at least 40 weeks (Goldin, 2014).

The descriptive statistics for our sample are included in Table 1. White men, on average, earned \$19.23 in hourly wages and worked 44.54 hours per week. White women earned \$13.92 on average and worked about 41.57 hours per week. Black women worked 41 hours on average and had an hourly wage of \$12.97. Finally, black men earned \$15.23 on average and worked about 43 hours on average. White men in the sample tended to have about one-tenth of a standard deviation more children in the household than white women despite working longer hours per week. Given that selection into the sample is based on working at least 35 hours per week, the fact men have more children in the household could point to the differences in household production between men and women.

Table 1: Summary Statistics

	White Men		White Women		Black Women		Black Men	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Real Hourly Wage (Year 2000)	19.23	14.15	13.92	9.96	12.97	9.13	15.23	10.89
Hours	44.54	8.51	41.57	6.11	40.91	5.45	42.62	7.30
Age	38.58	11.87	38.28	11.94	38.29	11.57	38.49	11.85
Less than High-School	0.14	0.35	0.10	0.30	0.12	0.33	0.18	0.38
High-School Graduate	0.34	0.47	0.35	0.48	0.36	0.48	0.38	0.49
Some College	0.24	0.43	0.27	0.44	0.30	0.46	0.26	0.44
College	0.17	0.38	0.19	0.39	0.15	0.35	0.12	0.32
Post-Graduate	0.10	0.31	0.10	0.30	0.07	0.26	0.06	0.23
Number of Children	1.08	1.24	0.95	1.12	1.14	1.25	0.93	1.28
Married	0.70	0.46	0.60	0.49	0.38	0.49	0.54	0.50
Full-Year Worker	0.89	0.31	0.85	0.36	0.85	0.36	0.86	0.35
Weeks Worked	48.31	9.56	46.96	11.24	46.99	11.41	47.26	11.02
Observations	1,290,979		907,022		136,947		124,214	

Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS.

*Real Hourly Wage* is generated by dividing the total income from wages in the previous year by the product of usual hours worked per week and number of weeks worked. Due to the use of imputed wages, which can result in extreme values (both high and low) for the wages, we winsorize the wage data to the middle 99% of the data. *Hours* are the reported usual number of hours worked per week. *Less than High-School* is an indicator equal to one if the respondent reported less than 12 years of schooling completed or that they did not receive a diploma. *High-School Graduate* is an indicator equal to one if the respondent reported having a diploma or completing 12 years of high school and it is unclear whether the respondent graduated. *Some College* is an indicator equal to one if the respondent reported having 1–3 years of college experience. *College* is an indicator equal to one if the respondent reported completing four years of college or having a college degree. *Post-Graduate* is an indicator equal to one if the respondent reported completing more than 4 years of college or having a graduate degree. *Number of Children* is an IPUMS generated variable for the number of children the respondent has living in the household. *Married* is an indicator equal to one if the respondent reported being married. *Full-Year Worker* is an indicator variable equal to one if the worker reported working at least 40 weeks the previous year. *Weeks Worked* is the number of weeks worked the previous year.

<sup>3</sup>Unwinsorized results are available upon request.

### 3.1 Description of Gender Wage Convergence

Prior to providing causal estimates in Section 4, we provide descriptive results here. The descriptive results help to illuminate what is occurring in the data during the sample period. The results here also provide details on how we obtain estimates for the gender wage gap that are used in subsequent sections. In our analysis, we rely primarily on gender wage gaps obtained via ordinary least squares. The regression model we use is

$$\log(w_{it}) = \alpha_{0t} + \beta_{1t}WW_{it} + \beta_{2t}BW_{it} + \beta_{3t}BM_{it} + \vec{\gamma}_t \cdot \vec{X}_{it} + \epsilon_{it}. \quad (1)$$

The dependent variable is the natural log of the implied real hourly wage calculated from the ASEC data. The variables of interest are  $WW_{it}$ ,  $BW_{it}$ , and  $BM_{it}$ , which are indicator variables equal to one if worker  $i$  in year  $t$  is a white woman, black woman, or black man. We estimate the regressions separately for each year in the sample and include a vector of observable worker characteristics, including educational indicators, a quadratic in age, state fixed effects, occupation fixed effects, hours worked per week, and a full-year indicator. We follow [Blau and Kahn \(2017\)](#) and omit marital status variables and the number of children in the regressions. We do consider these characteristics in heterogeneity analyses presented in Section 6.

In Figure 2, we plot the estimated gender wage gap between white men and white women (upper left panel) and the estimated racial wage gap between white men and black men (upper right panel) from Equation 1.<sup>4</sup> In the lower left and right panels, we report the average rate of convergence in each of the wage gaps before and after the passage of the FMLA along with the 95% confidence intervals. The results show that there is steady wage convergence between white men and white women prior to the passage of the FMLA in 1993. Thereafter, the trend appears to stagnate. For black men, however, wage gaps relative to white men do not show a trend either before or after the passage of the FMLA.<sup>5</sup> To test if the break in trend is statistically significant, we run a piece-wise linear regression of the estimated wage gaps from Equation 1 on a time trend variable, where we allow for a discontinuous change in the slope of the rate of wage convergence and in the intercept of the wage gap at the FMLA year (1993)

$$\widehat{\text{Wage Gap}}_{g,t} = \alpha_{0,g} + \beta_g \text{Trend}_t + \gamma_g \mathbb{1}(\text{FMLA}_t) + \phi_g \mathbb{1}(\text{FMLA}_t) \times \text{Trend}_t + \epsilon_{t,g}. \quad (2)$$

In Equation (2) the variable  $\text{Trend}_t$  is a trend counter for the year centered around 1993

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<sup>4</sup>We obtain similar results to those presented for full-time, full-year workers in [Altonji and Blank \(1999\)](#).

<sup>5</sup>We include results for black women in Appendix I.

and  $\mathbb{1}(FMLA_t)$  is equal to one if the year is in the post-FMLA time period. Descriptively, for white women, we estimate that the rate of gender wage convergence prior to the FMLA is  $\hat{\beta}_1 = 0.97$  percentage points per year, where as the post-FMLA rate of gender wage convergence is  $\hat{\beta}_1 + \hat{\phi}_1 = 0.23$  percentage points per year. Both point estimates and the difference are statistically significant at the 0.01 significance level (see appendix Table A1). By contrast, we document no break in trend in convergence of the racial wage gap between black men and white men before and after the FMLA. Qualitatively, the results are consistent with a policy break that is gender-specific.

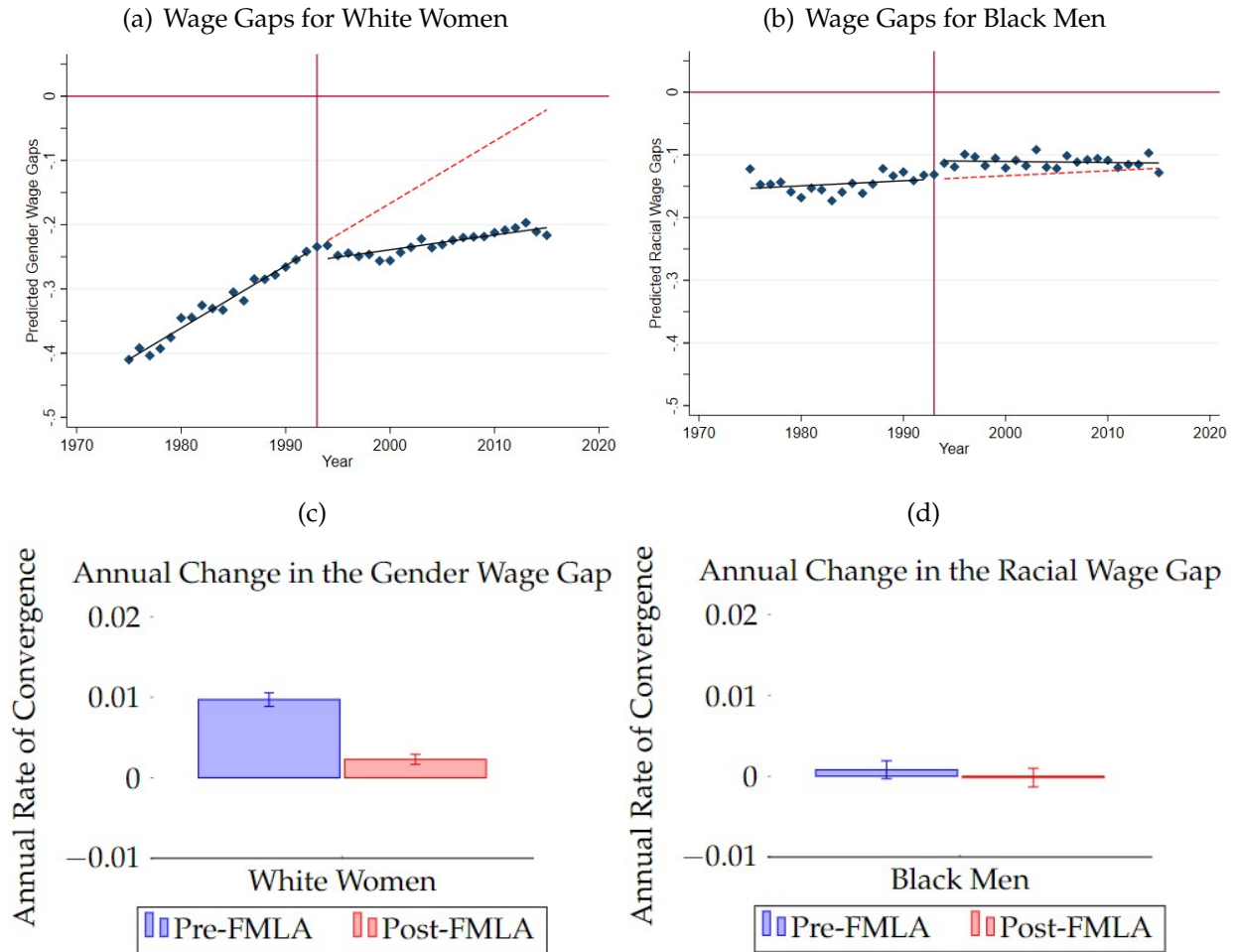
As a thought experiment, we extrapolate the pre-FMLA trends in the gender wage gap to determine when gender wage parity would have occurred in the absence of the FMLA. At the time that the FMLA is enacted, the gender wage gap is given by the constant term in the regression Equation (2), and the pre-FMLA rate of convergence in the gender wage gap is given by the coefficient on trend,  $\hat{\beta}_g$ . Under a linear extrapolation, white women would have achieved gender wage parity in 2017.

The patterns documented in Figure 2 are suggestive of the fact the workplace regulations imposed by the FMLA stagnated gender wage gaps. A second piece of corroborating evidence comes from altering our model in Equation (2) by moving the break in the piece-wise linear regression from 1993 to alternative placebo years. Following the approach in Landais (2015), we plot the  $R^2$  from the regression as a function of the chosen break year in Figure A2 in the Appendix. We find that the year which maximizes the  $R^2$  is close to 1993, which is also the year in which FMLA is passed. It is important to note, however, that many years in the vicinity of 1993 also yield  $R^2$  values that are close to the maximum value. This result is more reassuring than it is strong evidence that the FMLA caused the stagnation in gender wage convergence.

## 4 Empirical Specification and Causal Estimates

In Section 3.1, we present descriptive results on the gender wage gap for the sample period 1975–2015. Those results should only be considered descriptive due to several concerns. The crucial threat to identification with the descriptive results is that other federal policies that occurred at the same time as the FMLA could be contributing to the stagnation in gender wage convergence that we observe. In order to address the concern of policy endogeneity, we exploit state variation in the timing of family-leave policies that occurred prior to the FMLA. Between 1972–1992, 12 states and Washington, D.C. en-

Figure 2: Estimated Trends in National Wage Gaps (1975–2015)



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. The figures above show the estimated wage gap between white men and white women (a) and black men (b). The trend rate prior to and after the passage of the FMLA are presented for white women in (c) and black men in (d). The estimates are from Equation (1) and Equation (2).

acted job-protected, unpaid maternity-leave mandates that were similar in coverage to the family-leave offered by the FMLA (Waldfoegel, 1999). Since these policies all predated the FMLA, a strong test for whether family-leave policies caused gender wage stagnation is to test whether we observe stagnation in gender wage convergence following the enactment of the state-level leave policies. Given that the pre-FMLA state policies all occur during a time of rapid gender wage convergence in the US overall, finding evidence of stagnation in the gender wage gap due to the policies would provide compelling evidence of our hypothesis that family-leave policies caused gender wage stagnation.

In Table 2, we report the date when a state first enacted parental leave policies, following the coding used in Waldfoegel (1999). To understand the effect of the state-level policies, we omit states that did not pass parental-leave policies prior to the passage of the FMLA in 1993. We bring these states back into the analysis in Section 4.3. As a falsi-

fication exercise, we use the state-variation in maternity-leave policies to test whether we observe a similar pattern of convergence in the racial wage gap between black men and white men before the enactment of state leave polices and stagnation in the racial wage gap thereafter.

Table 2: **Date of Family-Leave Policy by State**

State	Maternity	Paternity
Massachusetts	1972	-
Connecticut	1973	1990
Washington	1973	1989
California	1980	1992
Minnesota	1987	1987
Rhode Island	1987	1987
Maine	1988	1991
Oregon	1988	1988
Tennessee	1988	-
Wisconsin	1988	1988
New Jersey	1990	1990
Washington, DC	1991	1991
Vermont	1992	1992
All other states (FMLA)	1993	1993

We report the dates that workers in a given state first had access to unpaid maternity and paternity leave as a result of a state mandate or the Family and Medical Leave Act (1993). The coding of the laws follows [Waldfogel \(1999\)](#).

## 4.1 Event Study Research Design

For our event study specification, we restrict our sample to observations that fall within a 10 year window before or after a family-leave policy is enacted. We regress the log of the implied hourly wage for worker  $i$  in state  $s$  in calendar-year  $t$  and event-year  $\tau$  i.e.  $\log(\omega_{ist\tau})$ , on a sequence of event-time indicators,  $\mathbb{1}(\tau' = \tau)$ . To capture heterogeneity by race and gender, we interact the event time indicators with indicator variables for race and gender. The reference group in our specification is white men. As is standard in wage regressions, we control for individual worker characteristics, including a quadratic in age, fixed effects for the different levels of education, and 3-digit occupation fixed effects. We also control for calendar-year fixed effects and state fixed effects. The equation we use is

$$\begin{aligned}
\log(\omega_{ist\tau}) = & \sum_{\tau'=-10}^{-2} \beta_{\tau} \mathbb{1}(\tau' = \tau) + \sum_{\tau'=0}^{10} \beta_{\tau} \mathbb{1}(\tau' = \tau) + \\
& \sum_{\tau'=-10}^{-2} \beta_{\tau,ww} WW_i \times \mathbb{1}(\tau' = \tau) + \sum_{\tau'=0}^{10} \beta_{\tau,ww} WW_i = 1 \times \mathbb{1}(\tau' = \tau) + \\
& \sum_{\tau'=-10}^{-2} \beta_{\tau,bw} BW_i \times \mathbb{1}(\tau' = \tau) + \sum_{\tau'=0}^{10} \beta_{\tau,bw} BW_i \times \mathbb{1}(\tau' = \tau) + \\
& \sum_{\tau'=-10}^{-2} \beta_{\tau,bm} BM_i \times \mathbb{1}(\tau' = \tau) + \sum_{\tau'=0}^{10} \beta_{\tau,bm} BM_i \times \mathbb{1}(\tau' = \tau) + \\
& \alpha_0 + \beta_{ww} WW_i + \beta_{bw} BW_i + \beta_{bm} BM_i + \vec{\gamma} X_i + Year_t + State_s + \epsilon_{ist\tau}.
\end{aligned} \tag{3}$$

The identifying assumption for estimating the model is that the timing of the law is random across treated units.

The coefficients of interest from the model are  $\beta_{\tau,ww}$ , which represents the average gender wage gap between white women and white men in event year  $\tau$ , relative to the gender wage gap between white men and white women in event-time  $\tau = -1$ . Secondary coefficients of interest are  $\beta_{\tau,bm}$ , which measures the average racial wage gap between black men and white men in event year  $\tau$ , relative to the racial wage gap between black men and white men in event-time  $\tau = -1$ . We also follow and use data available from [Kleven \(2019\)](#) and control for the passage of welfare reform during the 1990s at the state and federal level by interacting state-based indicators for welfare-reform with the family-leave event time indicators in Section 4.3.<sup>6</sup> We focus on the results for white women and black men in the body of the paper. However, in Appendix Figure A3 and A4, we report the event study results for black women – a group of workers who face the twin problem of discrimination on account of race and sex and the interaction of the two.<sup>7</sup>

## 4.2 Results Using State Variation in Leave Policies

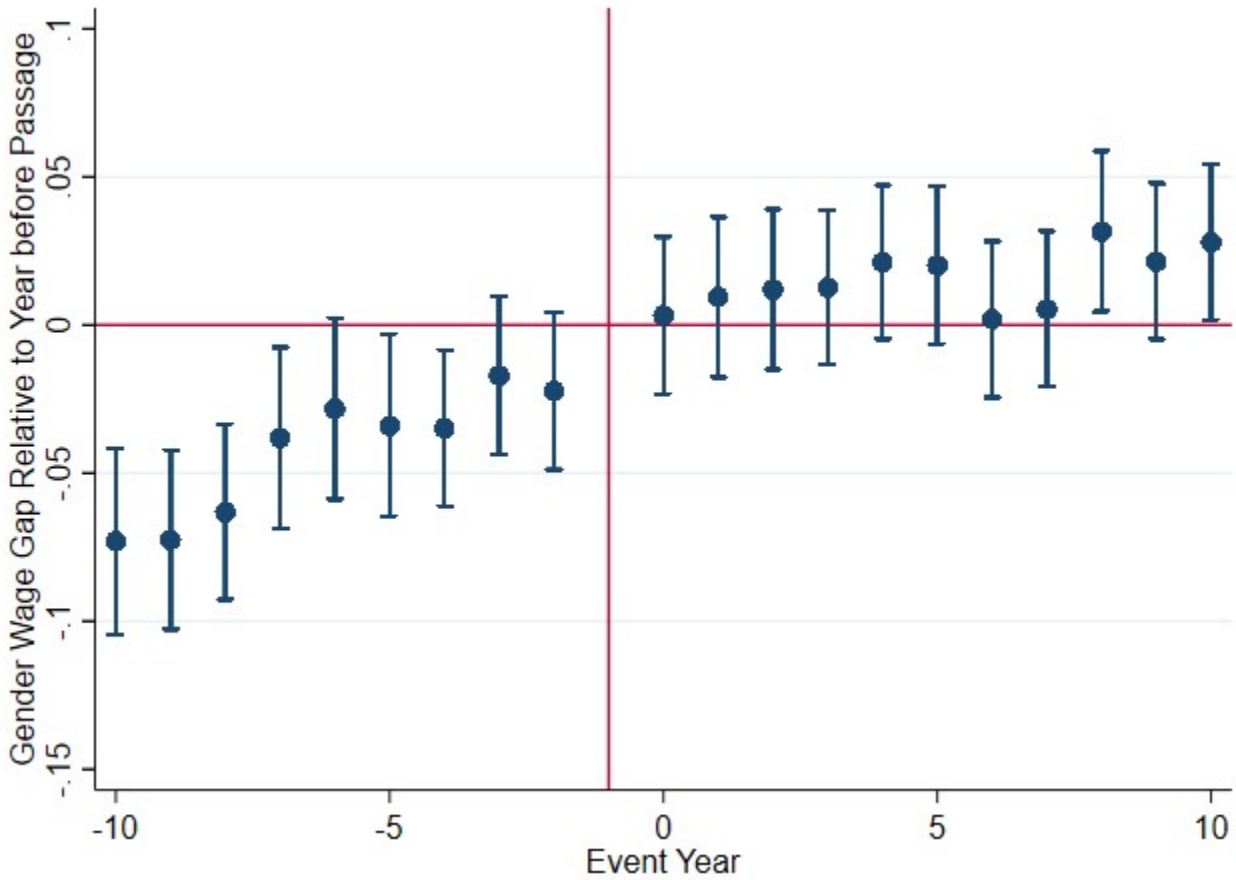
To begin, we set our event study specification to include only the observations for workers in states that passed family-leave policies prior to the passage of the FMLA. Focusing on these events exploits state-level variation that is less susceptible to contamination from the impacts of federal policy that is coincident with the FMLA. In Figure 3, we show that the gender wage gap converges prior to the passage of the leave policy and almost per-

<sup>6</sup>It is necessary to control for the welfare reform measures when we include the FMLA because the reforms may bias the results of the states which are only affected by the FMLA.

<sup>7</sup>All results for black women can be found in Appendix I.

fectly stagnates for the full decade after the policy is in place. It is clear from this figure that the family-leave policy does not impact the level of the gender wage gap instantaneously, but rather it eliminates the convergence.

Figure 3: Event Study of White Female Wage Gap Using State Variation



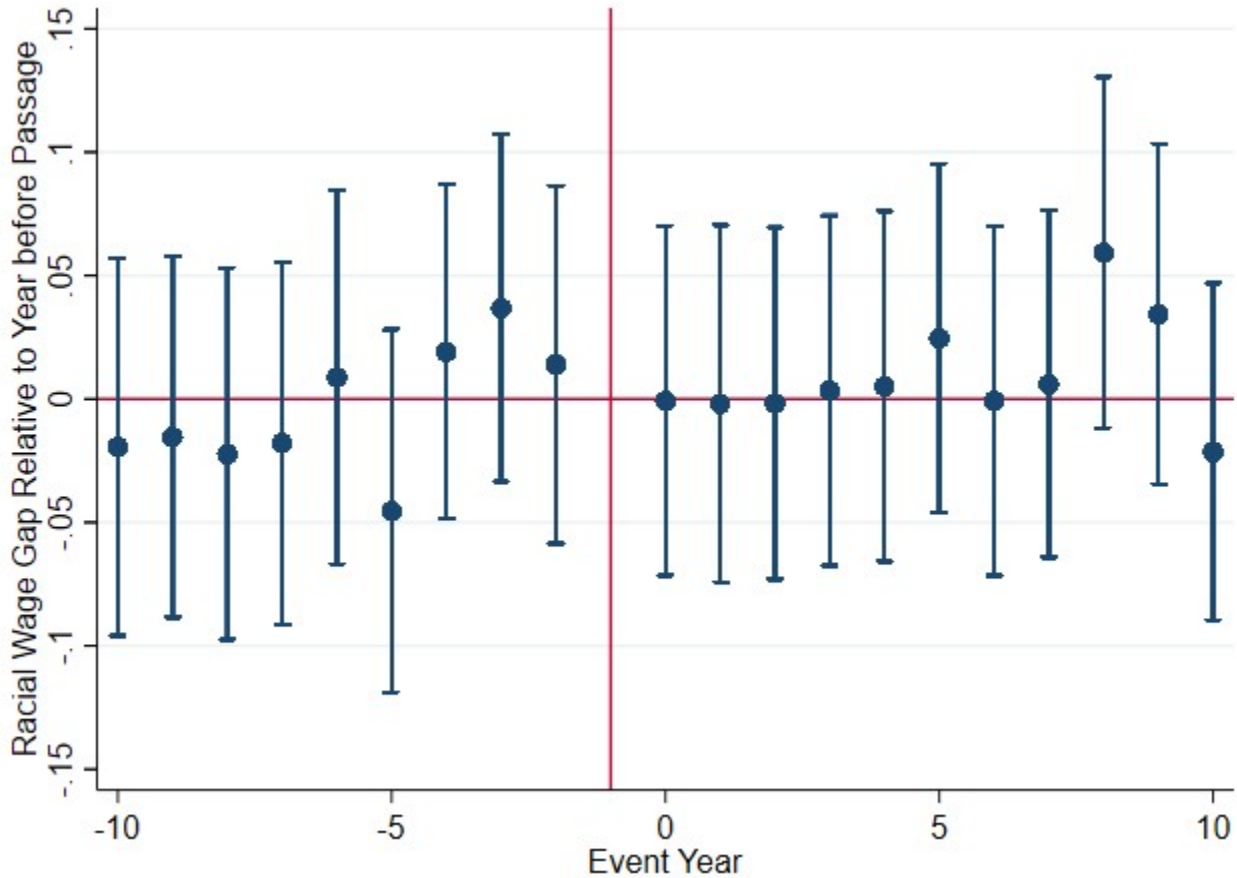
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS and [Waldfoegel \(1999\)](#).

This figure is an event study plot of the gender wage gap between white women and white men before and after the introduction of state mandated maternity leave. The gender wage gap is reported relative to its value in the time period before the event, i.e.,  $\tau = -1$ . It uses data from 12 states and Washington, D.C., which each enacted an FMLA-type maternity-leave policy during the period 1972–1992 before the federal mandate. We use robust standard errors to correct for heteroskedasticity.

As a falsification test, in Figure 4, we plot the event study results for the racial wage gap between black men and white men. Relative to the racial wage gap in  $\tau = -1$ , the racial wage gap at the beginning of the pre-period  $\tau = -10$  and the end of the post period  $\tau = 10$  are both less than 3 log points. All of the point estimates are statistically insignificant from zero and only one is larger than 5 log points. In summary, there is no pattern of convergence in the racial wage gap before the event time nor afterwards; neither is there a change in the trend in the racial wage gap going from the pre-period into the post-period.

Combining the results from the racial wage gap event study with those from the gender wage gap, it is clear that the introduction of family-leave policies stagnates wage convergence for white women but not black men. It is therefore unlikely that other state-level policies, which are unrelated to gender, could be driving the stagnation in gender wage convergence.

Figure 4: Event Study of Black Male Wage Gap Using State Variation



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS and [Waldfoegel \(1999\)](#).

This figure is an event study plot of the racial wage gap between black men and white men before and after the introduction of state mandated maternity leave. The racial wage gap is reported relative to its value in the time period before the event, i.e.,  $\tau = -1$ . It uses data from 12 states and Washington, D.C., which each enacted an FMLA-type maternity-leave policy during the period 1972–1992 before the federal mandate. We use robust standard errors to correct for heteroskedasticity.

To estimate the impact of leave policies on the rate of convergence in the wage gap, we regress the event study point estimates of the wage gap for a given demographic group ( $\widehat{\text{wage gap}}_{\tau,g}$ ) on a linear event-time trend ( $Trend_{\tau,g}$ ), allowing for a change in both the level and the slope after the event time. Additionally, we weight each observation of the event-time wage gap in the regression by the inverse of its standard error. The exact

specification that we run is

$$\widehat{\text{wage gap}}_{\tau,g} = \tilde{\alpha}_{0,g} + \tilde{\beta}_g \text{Trend}_{\tau,g} + \tilde{\gamma}_g \mathbb{1}(\tau \geq 0) + \tilde{\phi}_g \mathbb{1}(\tau \geq 0) \times \text{Trend}_{\tau,g} + \tilde{\epsilon}_{\tau,g}.^8 \quad (4)$$

Table 3: **Rate of Wage Convergence Before and After State Leave Laws**

	White Women	Black Women	Black Men
Event-time Trend ( $\tilde{\beta}_g$ )	0.0073 (0.0009)	0.0093 (0.0030)	0.0040 (0.0024)
Post ( $\tilde{\gamma}_g$ )	0.0064 (0.0081)	-0.0504 (0.0261)	-0.0176 (0.0213)
Event-time Trend $\times$ Post ( $\tilde{\phi}_g$ )	-0.0057 (0.0013)	-0.0070 (0.0042)	-0.0020 (0.0034)
Constant	0.0012 (0.0056)	0.0313 (0.0179)	0.0174 (0.0147)
Rate of Convergence Post Period ( $\tilde{\beta}_g + \tilde{\phi}_g$ )	0.0016 (0.0009)	0.0023 (0.0030)	0.0019 (0.0025)
Observations	20	20	20
R-squared	0.9404	0.4118	0.2521

Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS and [Waldfogel \(1999\)](#). Standard errors are given in parentheses. Regression of the estimated event-time wage gap on a piece-wise event-time trend that allows for a different slope and intercept following a family-leave policy. The sample is restricted to only those states with maternity leave mandates that pre-date the FMLA. The model is run separately on the event-time wage gaps for white women, black men and black women.

In Table 3 we report our results from estimating Equation (4). From column 1, we notice that prior to the leave policy the gender wage gap experienced by white women was falling at a rate of 0.75 percentage points per year (p-value <0.001). In the post period, the rate of gender wage convergence falls by 0.61 percentage points per year to 0.14 percentage points per year. The decline is statistically and economically significant, and the post-leave rate of gender wage convergence is not statistically different from zero. By contrast we find that the pre-leave rate of wage convergence for black men was comparatively smaller. In fact, black men experience almost half of the convergence when compared to rate of wage convergence for white women and is not statistically significant at the 5% level of significance. Moreover, despite falling by 0.18 percentage points, the rate of wage convergence for black men in the post period is not statistically different

<sup>8</sup>The specification is identical to Equation (2), with the slight change that we use an event indicator  $\mathbb{1}(\tau \geq 0)$  that is defined by the state-level variation in leave policy rather than the federal variation used in the descriptive results.

from what it was in the pre-period. We find that family-leave policies reduce the rate of wage convergence for white women but not black men.

using only the state variation in family-leave policies prior to the FMLA

### 4.3 Results Using State & Federal Variation in Leave Policies

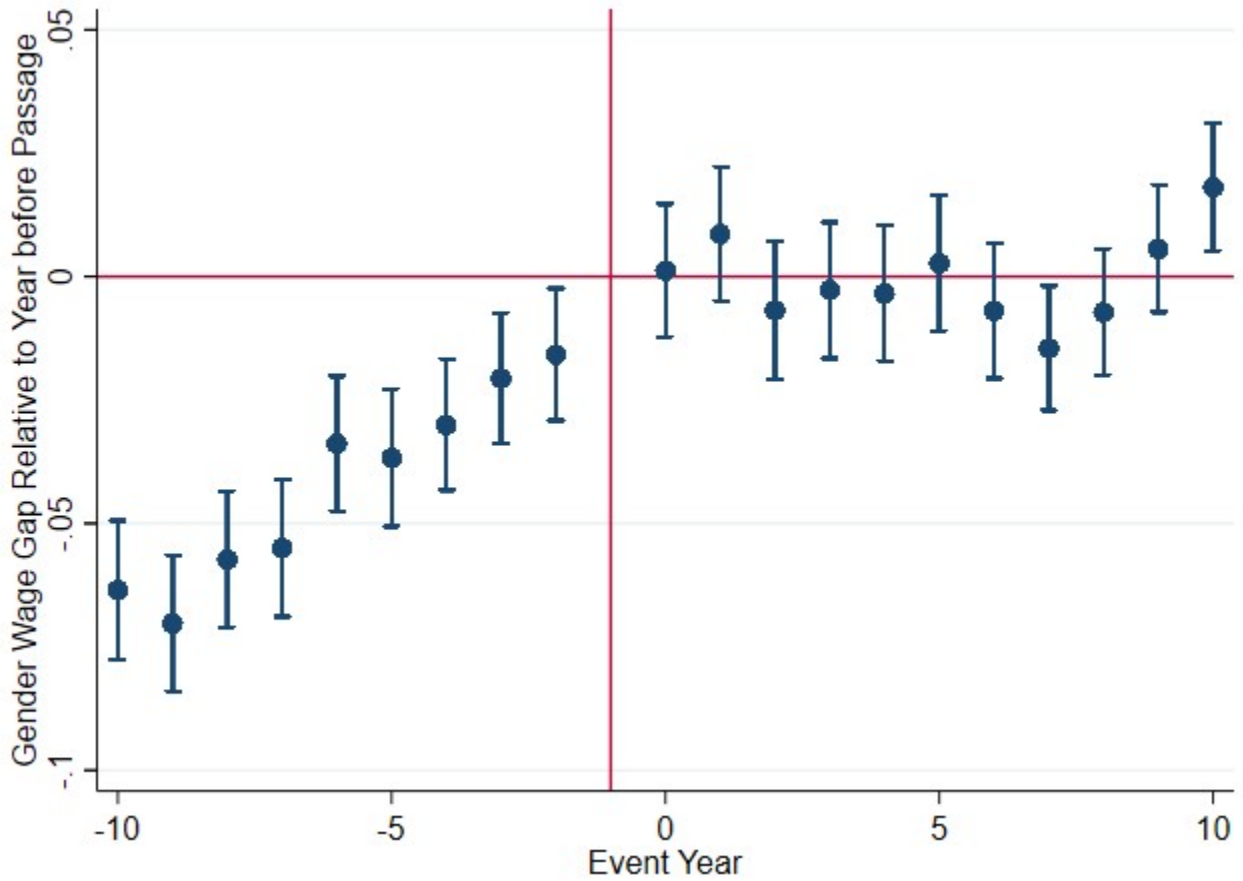
We generalize our results from Section 4.2 by implementing event studies that also include the federal variation deriving from the introduction of the FMLA. The results in Section 4.2 only use a subsample of workers living in states, and Washington D.C., that pass family-leave policies prior to the FMLA. Now, we include the 38 states where family-leave policies were first introduced with the enactment of the FMLA. We keep the event time the same for states with family-leave policies prior to the FMLA and we assign all other states to have family-leave policy events in 1993, the year the FMLA is enacted. In Figure 5 and Figure 6 we report the event study estimates for the full sample based on Equation (3) of the gender wage gap experienced by white women and the racial wage gap experienced by black men. The equation is augmented to include welfare controls.

Quantitatively, the results show that white women experienced about 7 log points of convergence in the gender wage gap in the decade preceding the passage of a family-leave policy (either state or federal) and no convergence after passage. Importantly, only one point estimate for white women after the policy is statistically significant ( $\tau = 10$ ). Performing Equation (4) on the new point estimates, we find that the gender wage gap faced by white women declined by a statistically significant 0.71 percentage points per year prior to the policy change (see Table 4) which is very similar to the pre-leave rate of gender wage convergence that we estimated using only the state variation (Table 3). After the policy change, the rate of wage convergence for white women declines by 0.65 percentage points, which indicates the pre-existing convergence is nearly offset by family-leave policies. Quantitatively, we find the pre-trend and post-trend for black men are lower using the full sample compared to the state-only sample, which culminates in a statistical drop in the post-period rate of convergence, which results in stagnation between white men and black men. However, the pre-trend for black men is still only a third of the observed pre-trend for white women; therefore, the statistical drop and stagnation after the policy is not surprising.

### 4.4 Stagnation in Wage Convergence Fully Explained by Leave Laws

Based on our estimates, using either the state variation or state and federal variation, family-leave policies reduced the annual rate of gender wage convergence for white women

Figure 5: Event Study of White Female Wage Gap Using National Variation



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS, [Waldfogel \(1999\)](#), and [Kleven \(2019\)](#)

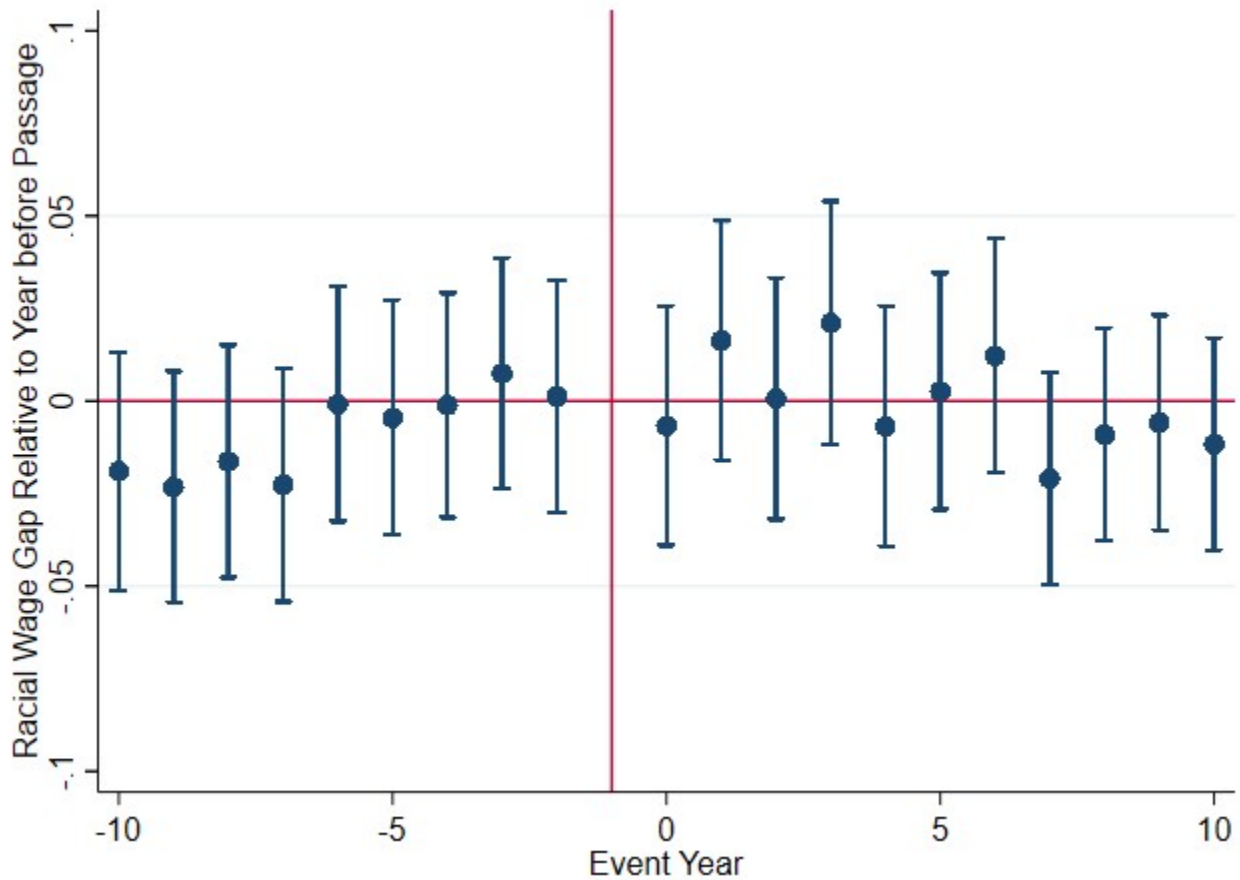
This figure is an event study plot of the gender wage gap between white women and white men before and after the introduction of a family-leave policy. The gender wage gap is reported relative to its value in the time period before the event, i.e.,  $\tau = -1$ . We use robust standard errors to correct for heteroskedasticity.

by more than 0.60 percentage points per year. To measure how much of the observed stagnation in gender wage convergence post-1993 is explained by family-leave policies, we use the wage decomposition approach in [Blau and Kahn \(2006\)](#) which builds on the method developed in [Juhn et al. \(1991\)](#). The method starts with a data generating process in which wages  $Y_{it}$ , are a function of observable worker characteristics  $X_{it}$ , the return to these characteristics  $\beta_t$ , and a residual which comprises a standardized index measure of unobserved worker skill  $\theta_{i,t}$  and the price of the unobservable skill  $\sigma_t$ , as expressed in the following equation

$$Y_{it} = \beta_t X_{it} + \sigma_t \theta_{it}. \quad (5)$$

Changes in the wage gap during the pre-period (1976–1992) and the post period (1993–2015) are decomposed into changes in observed Xs, changes in observed prices of observ-

Figure 6: Event Study of Black Male Wage Gap Using National Variation



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS, [Waldfogel \(1999\)](#), and [Kleven \(2019\)](#)

This figure is an event study plot of the racial wage gap between black men and white men before and after the introduction of a family-leave policy. The racial wage gap is reported relative to its value in the time period before the event, i.e.,  $\tau = -1$ . We use robust standard errors to correct for heteroskedasticity.

ables ( $\beta$ ), changes in unobserved skills ( $\theta_{it}$ ; called the “Gap Effect”) and changes in the price of unobserved skill ( $\sigma_t$ ). For details on how the procedure is implemented, see [Blau and Kahn \(2006\)](#).

In [Table 5](#), we report the change in the gender wage gap for (1976-1992) and for (1993-2015) and the difference in the two differences. For each time period we further decompose the period change in the gender wage gap into changes from observed X’s, observed prices, unobserved skill (“Gap Effect”), and unobserved prices. We find the gender wage gap decreased by 19.3 percentage points during the pre-period, but it only declined by 8.1 percentage points during the post period – a net difference of 11.2 percentage points ([Table 5](#)). The driver of the differences in the across period decline is the dramatic decrease of 17 percentage points in the gap effect. The decline of the gap effect is crucial because of what it measures. As articulated in [Blau and Kahn \(2006\)](#): “The Gap Effect mea-

Table 4: Rate of Wage Convergence Before and After Leave Policies (State or Federal)

	White Women	Black Women	Black Men
Event-time Trend	0.0070 (0.0008)	0.0043 (0.0015)	0.0025 (0.0010)
Post	-0.0041 (0.0075)	0.0002 (0.0136)	0.0105 (0.0088)
Event-time Trend $\times$ Post	-0.0064 (0.0012)	-0.0049 (0.0022)	-0.0055 (0.0014)
Constant	-0.0002 (0.0051)	-0.0028 (0.0093)	0.0052 (0.0060)
Rate of Convergence Post Period ( $\tilde{\beta}_g + \tilde{\phi}_g$ )	0.0007 (0.0009)	-0.0005 (0.0016)	-0.0029 (0.0010)
Observations	20	20	20
R-squared	0.9190	0.5377	0.5370

Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS and [Waldfogel \(1999\)](#).

Standard errors are shown in parentheses. Regression of the estimated event-time wage gap on a piece-wise event-time trend that allows for a different slope and intercept following a family-leave policy (state or federal). The model is run separately on the event-time wage gaps for white women, black men and black women.

sure the effect of changing differences in the relative positions of men and women in the male residual wage distribution, including the effect of an improvement in women’s unmeasured characteristics or a reduction in the extent of discrimination against women.”. Given the differences in family-leave taking between men and women, family-leave policies may simultaneously decrease the unmeasured characteristics of women in the labor market and increase the extent of discrimination women face.

Table 5: Wage Decomposition Pre- and Post-FMLA

Time Period	1976-1992	1993-2015	Difference
Change in Gender Wage Gap	-0.1927	-0.0810	-0.1117
Observed Xs	-0.0861	-0.0398	-0.0463
Observed Prices	0.0596	-0.0377	0.0973
Gap Effect	-0.1857	-0.0153	-0.1704
Unobserved Prices	0.0195	0.0118	0.0077

Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. In this table we report a new analysis following the methodology of Blau and Kahn (2006). Our analysis shows that the gender wage gap converged by 19 percentage points during the pre-FMLA period of our sample but only decreased by 8 percentage point during the post-FMLA period. Moreover, the results show that the convergence due to the gap effect collapsed by 17 percentage points.

Using the causal estimates from the state and federal variation of a 0.65 percentage

point decline in the annual rate of gender wage convergence after the passage of maternity leave laws and projecting it over the 22 year period 1993–2015 we predict a differential drop of 14.3 percentage points. We can therefore explain 84% of the difference in the rate of gender wage convergence in the pre and post period caused by the gap effect.<sup>9,10</sup>

## 5 Whose Wages Changed to Cause Stagnation?

Was it changes in the wages of women or changes in the wages of men that explain why state and federal family-leave policies stagnated gender wage convergence? To make progress on this question, we first plot average wages of men and women over time in Figure 7 to build intuition based on the descriptive facts. Figure 7 suggests that men experience declining real wages prior to the FMLA, while women experience increasing wages prior to the FMLA. Therefore, convergence in the raw gender wage gap prior to the passage of the FMLA is driven by both decreasing wages for men and increasing wages for women. After the FMLA, women’s wages continue to grow, but men’s wages stop declining and in fact begin to grow, as well.<sup>11</sup>

Because the evidence in Figure 7 is descriptive rather than causal we now turn to an event study, similar to the specification in Equation (3) using both the state and federal variation in leave laws. We make a change from the original equation by using wage levels instead of  $\log(\omega_{ist\tau})$ . In Figure 8, we show that, in the decade prior to the passage of the family-leave policy, wages for white men are stable. After the passage of a family-leave policy, wages for white men grow steadily to levels that are nearly \$1.50 per hour higher. By contrast, in Figure 9, prior to the implementation of a leave policy, women’s wages are increasing steadily to a level that is nearly \$1 per hour higher than one decade prior. After the policy, women’s wages continue to grow at nearly the same annualized rate compared to before the policy.

The results show that the stagnation is caused by an increase in wages paid to white men that is not reciprocated by the wages paid to white women. While we show that the wages paid to white women do not decline, consistent with prior research (Waldfoegel, 1999), we can find the stagnation in the gender wage gap is caused by the rebound in the wages of white men. In other words, white women experience declines relative to white

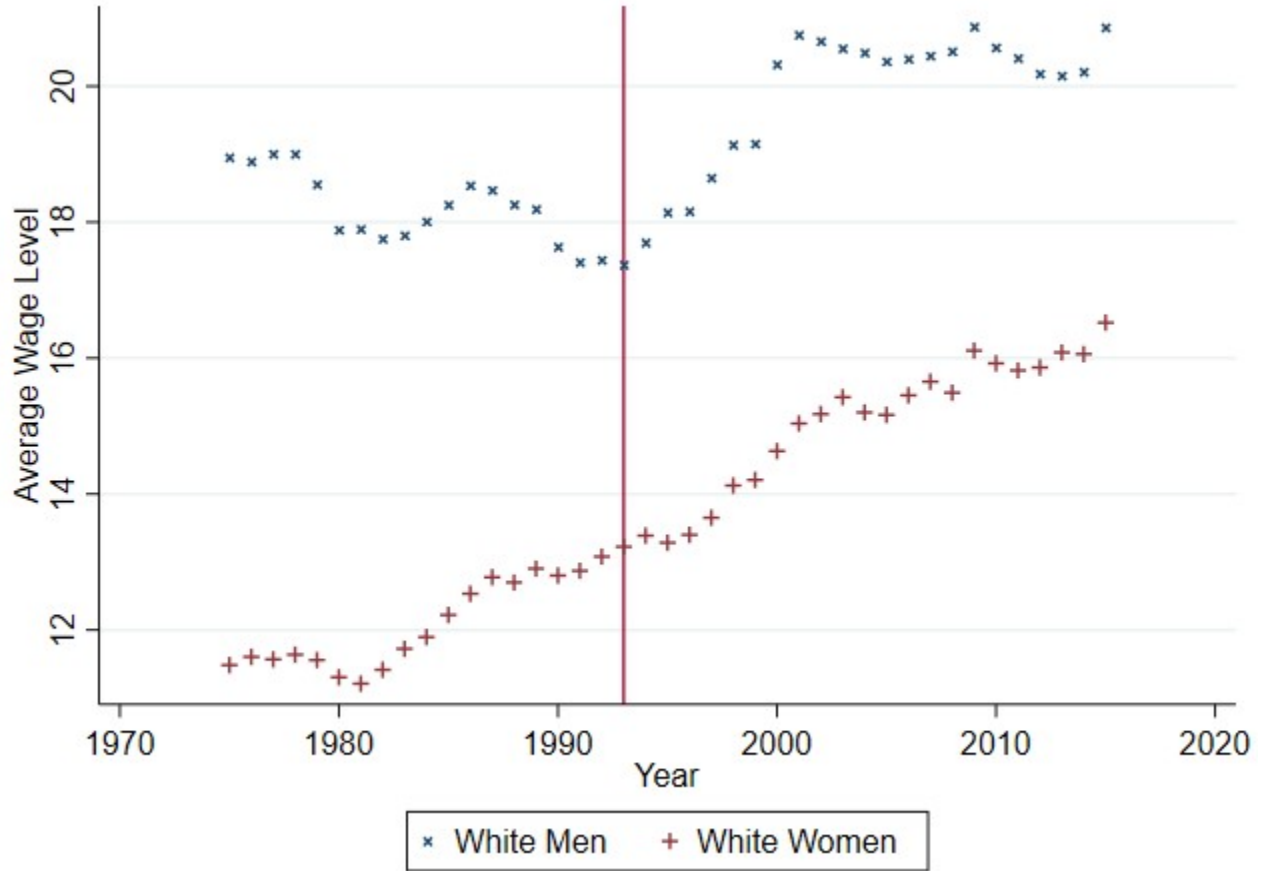
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<sup>9</sup>Using the state variation, we can also explain 79% of the decline in the gender wage gap caused by the gap effect.

<sup>10</sup>In Appendix Table A2, we show that our results closely mirror Blau and Kahn (2006) for the same years in their original paper.

<sup>11</sup>The change in wage growth for men is an effective reversal of wage decreases that men experience as women entered the labor market following WWII (Acemoglu et al., 2004).

Figure 7: Average Wages (1975–2015)



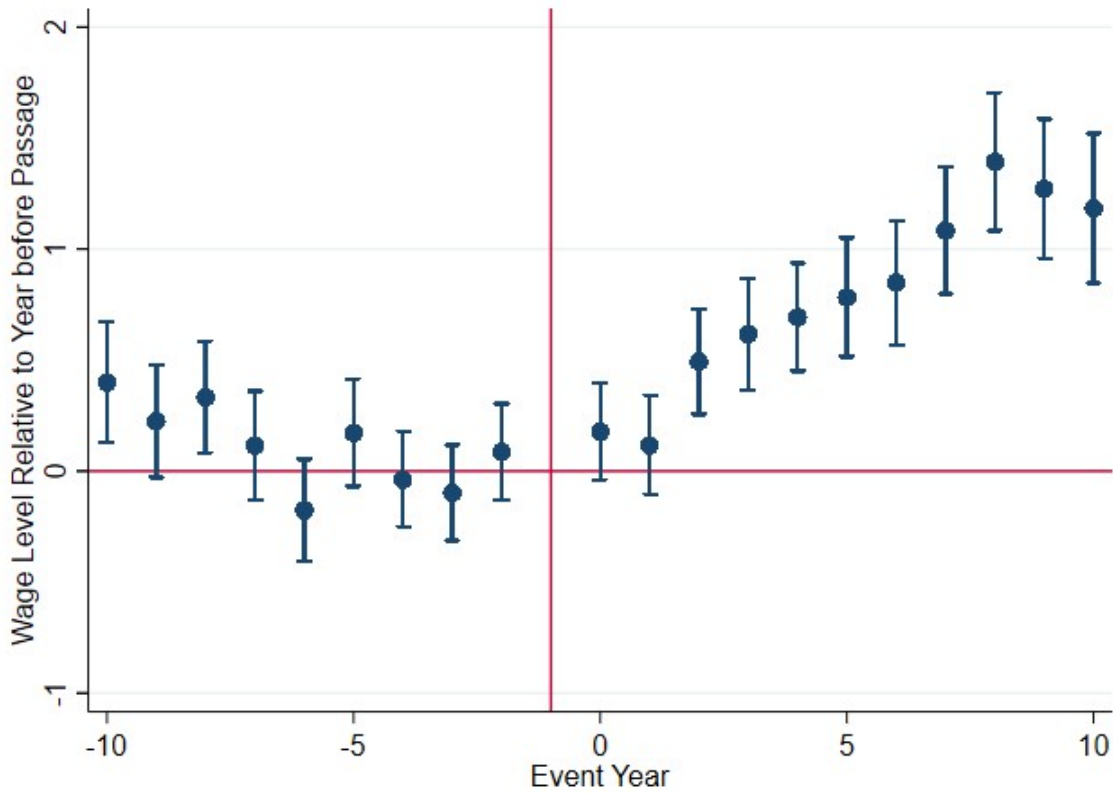
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS.  
This figure shows the average hourly wage for white men and white women per year without any controls.

men, but not absolute declines.

## 5.1 Wage Impacts by Skill Level

The two policies that may confound our results are welfare reform and the EITC. Because welfare reform occurred at different times based on state waivers, we can and do control directly for welfare reform in the causal evidence we presented in Section 4. However, the EITC is reformed nationally in 1993, so we cannot control for it directly in Section 4. To test whether the EITC and welfare reform are driving the results, we use the educational attainment of workers as a proxy for qualifying for either of the confounding policies. If the confounding policies were likely drivers of the stagnation, we would expect the largest effects to be centered around workers with a lower level of educational attainment,

Figure 8: Event Study: Wage Levels for White Men



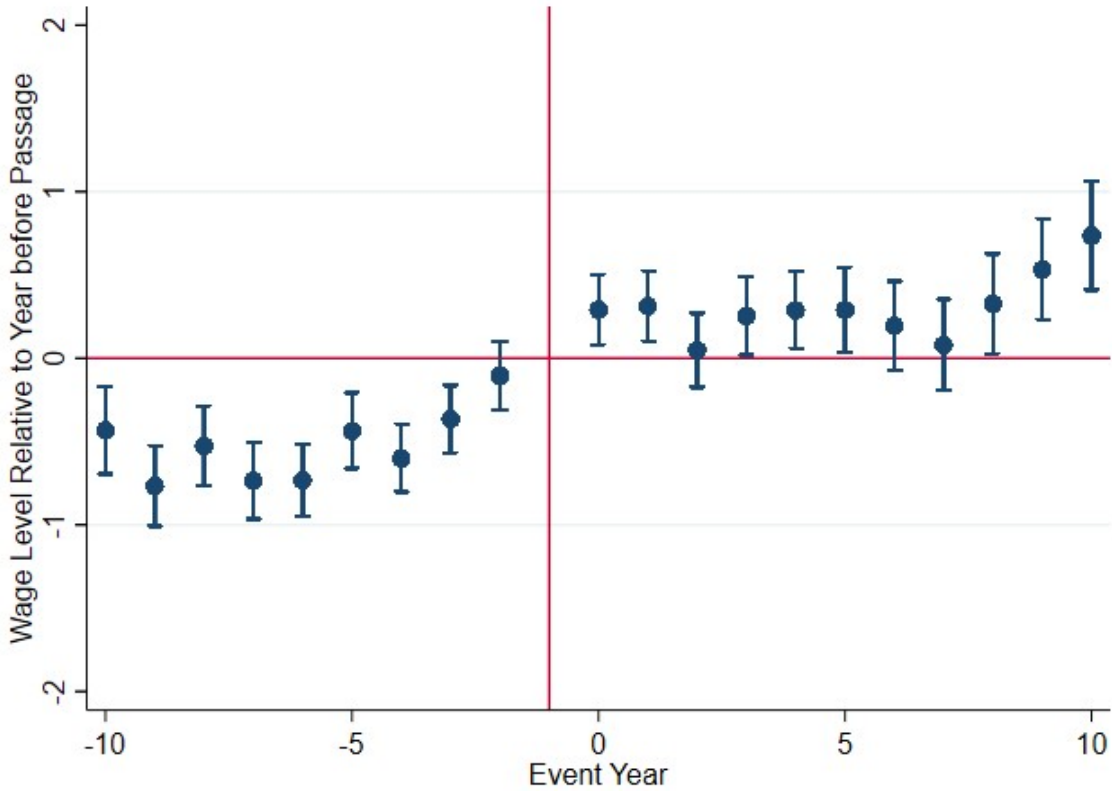
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. The figure above shows the results of the event study on wage levels for white men following the methodology of the event study in Equation (3). The results are provided by the estimated coefficients  $\beta_{\tau}$ .

who are more likely to qualify for welfare or the EITC.<sup>12</sup>

We plot an event study for the hourly wage by educational attainment for white men and white women in Figure 10. The methodology follows the event studies used in Section 5, but splits the sample into two groups by educational attainment: workers without a college degree and workers with at least a college degree. The results show that the strongest response to the passage of family leave occurs among workers who are college graduates. If the EITC or welfare reform were driving the results, we would have expected the opposite. The result suggests that neither the EITC or welfare reform were causing the stagnation. Moreover, [Kleven \(2019\)](#) shows that the EITC reform in 1993 does not have a large impact on labor supply, whereas the welfare reform, which we control for, does.

<sup>12</sup>86% of workers who are eligible for the EITC do not have a bachelor's degree ([Murray and Kneebone, 2022](#)). 94% of workers on TANF (welfare) do not have college degrees ([King, 2022](#)).

Figure 9: Event Study: Wage Levels for White Women



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. The figure above shows the results of the event study on wage levels for white men following the methodology of the event study in Equation (3). The results are provided by the estimated coefficients  $\beta_{\tau} + \beta_{\tau,ww}$ .

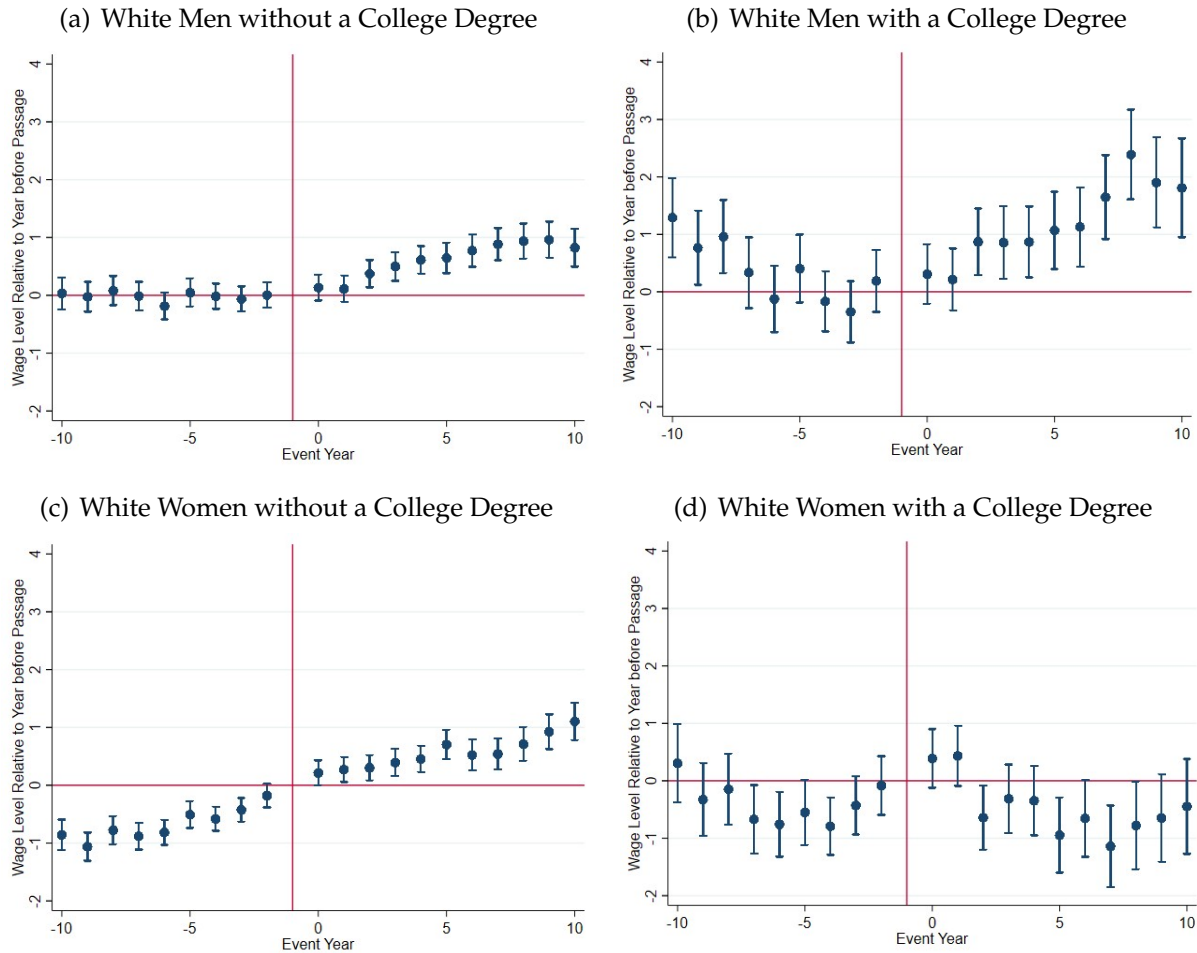
## 6 Heterogeneity Results

We show that event studies indicate the FMLA and other family-leave policies caused stagnation in the gender wage gap for white women using a sample of full-time workers. Having established that family-leave policies caused gender-wage convergence to stall, we now measure the heterogeneous impact of family-leave on the rate of gender wage convergence for 2 groups of workers: workers with children and workers without children.<sup>13</sup> First, we segment the data for each group. Second, within a group, we estimate the gender wage gap using the event study specification in Equation 3. Third, we use the point estimates from the event study to estimate the rate of convergence before and after family-leave using Equation 4. The analysis presented for each group is the same used to obtain the overall rate of gender wage convergence in Section 4. For comparison between the groups, we use a bootstrap with  $n = 100$  replications.

Due to differences in home production between men and women, especially with

<sup>13</sup>We also present a similar analysis for married and single workers in the appendix.

Figure 10: Event Study: Wage Levels Based on Educational Attainment



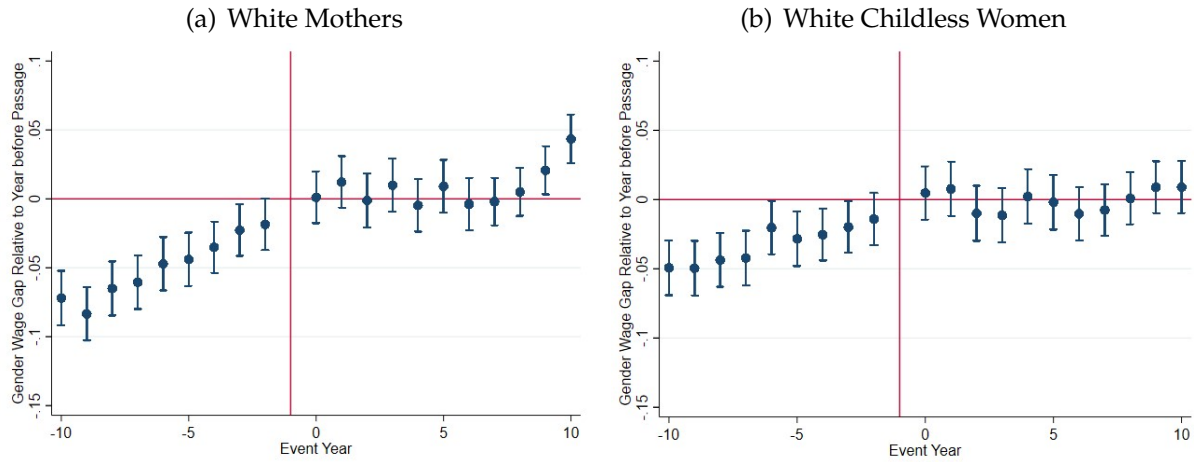
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS and the National Bureau of Economic Research.

The figure above shows the results of the event study on wage levels for white men and white women based on their educational attainment following the methodology of the event study in Equation (3). The results are provided by the estimated coefficients  $\beta_{\tau} + \beta_{\tau,ww}$ .

regards to child-rearing, we may expect women with children to experience a greater change in the convergence rate of the gender wage gap due to the passage of a family-leave policy than women without children (Goldin, 2014). In panel a of Figure 11, we show that white women with children experience a stronger pattern of convergence prior to the passage of a family-leave policy compared to white women without children (panel b). Both groups of women experience stagnation after the passage of a family-leave policy, but the decline in the rate of convergence is stronger for white women with children.

The rates of convergence before and after the passage of a family-leave policy for white women with children and those without are presented in Table 6. At the time a family-leave policy is passed, women with children face a wage gap of -34% compared to men with children. The wage gap faced by white women with children is 15% larger than that

Figure 11: Event Study: Family Leave Policy on Gender Wage Gaps



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS  
 In the figure above, we have reported the results of event studies for convergence in wage gaps between white men and white women for workers with children (a) and workers without children (b).

Table 6: Annual Rate of Wage Convergence for White Women

	Parents	Childless	Difference
Convergence Rate Before (p.p.)	0.804 (0.007)	0.527 (0.007)	0.278 (0.010)
Drop in Convergence Rates (p.p)	0.557 (0.010)	0.424 (0.010)	0.133 (0.014)
Convergence Rate After (p.p.)	0.247 (0.007)	0.102 (0.008)	0.145 (0.011)

Gender Wage Gap at Passage

Bootstrap standard errors in parentheses

Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS.

In the table above, we report the convergence rates in wages before and after the passage of family-leave policies for different groups of workers. The results are obtained by estimating Equation (4) on the point estimates displayed in Figures 11 using a bootstrap over  $n = 100$  replications.

faced by white women without children (-19%). In the decade prior to the passage of the family-leave policy, the gender wage gap for white women with children converged at a rate of 0.83 percentage points per year compared to 0.53 percentage points per year for white women without children. The difference is statistically significant at the 1% significance level. After the policy, the convergence rate for white women with children declines by 0.133 percentage points more than the decline for white women without children (p-value less than 0.01). The post-policy rate of gender wage convergence is 0.25

percentage points for white women with children and 0.09 percentage points for white women without children.

We show both white women with children and white women without children experience stagnation in the gender wage gap. We expect to see a larger decline for white women with children because 25% of FMLA claims are filed around the birth of a child (Brown et al., 2020), which we find. However, we still expect a decline for white women without children because the FMLA also allows for leave due to the care of family members (24% of claims), which more commonly falls on women, regardless of parental status (Brown et al., 2020). Therefore, our results are consistent with our priors on parental status as well as the observed usage rates of workers.

## 7 Back of the Envelope Calculation for Costs

So far we have shown that leave policies contribute to the stagnation of the gender wage gap. Now, we will quantify the impact of family-leave policies on annual earnings for white men and white women.

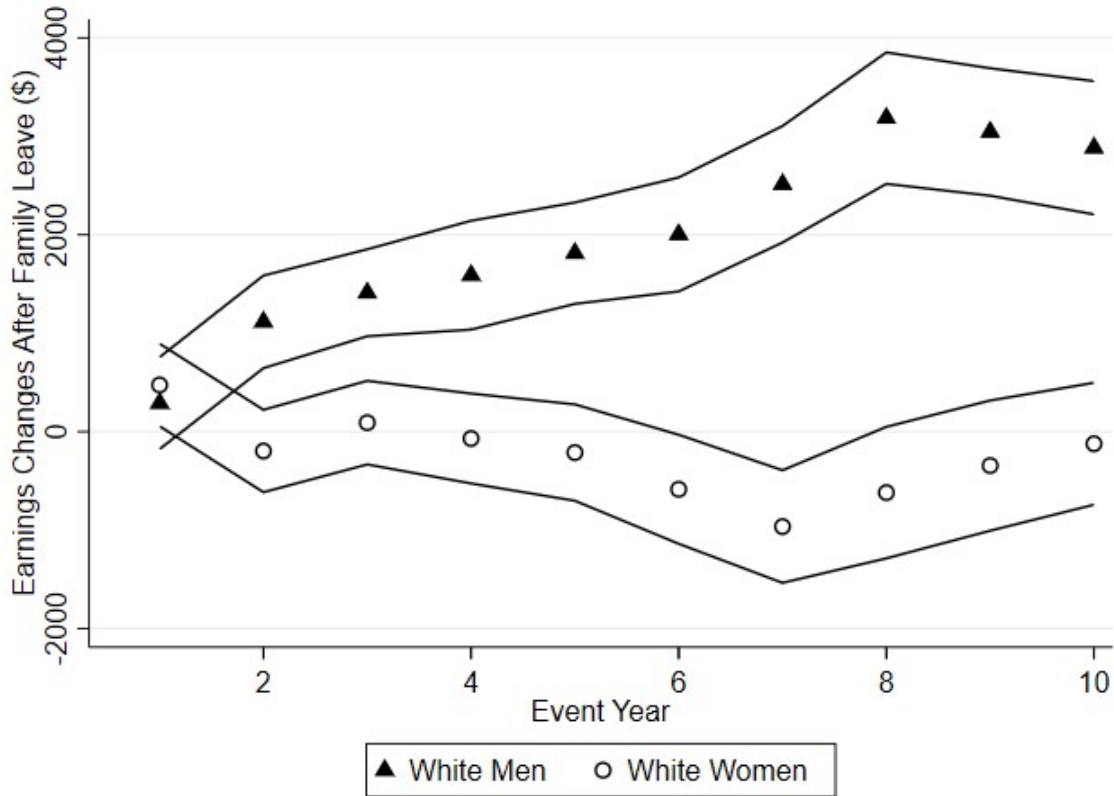
To estimate the impact on earnings for workers in our sample, we use event study estimates for the causal impact of a family-leave policy on the level of wages for workers using state-specific family-leave policies and the federal FMLA (Section 5). We use the rate of wage growth prior to the passage of a family-leave policy,  $\tilde{\beta}_g$ , to create a predicted counter-factual wage level without family-leave for the period after passage (see Equation 4). We calculate

$$PredictedWage_{g\tau} = \bar{Wage}_{g,\tau=0} + \tilde{\beta}_g \times Trend_{\tau}, \quad (6)$$

where  $PredictedWage_{g\tau}$  is the counter-factual wage for demographic group  $g$  in event-year  $\tau$ .  $\bar{Wage}_{g,\tau=0}$  is the sample average for all workers in demographic group  $g$  in the event-year zero.  $\tilde{\beta}_g \times Trend_{\tau}$  provides the counter-factual wage growth without family-leave. Next, we compare the counter-factual wage level to the observed wage level after the passage of family leave. We obtain the annual earnings impacts by multiplying the difference between the counter-factual and observed wage levels for each demographic group, a measure of the hourly wage cost of family-leave, by 2,000 hours to see the effect of the policy on a full-time, full-year employee with 2 weeks of vacation.

In Figure 12, we show the results for the back of the envelope calculation for the 10 years after the passage of a family-leave policy. In the first year, white men and white women experience very similar earnings impacts, which is consistent with the findings of Waldfoegel (1999) that there is no short-run impact on wages of FMLA. Because we use a

Figure 12: Back of the Envelope Calculation Results



In the figure above, we have reported the results of a back of the envelope calculation for annual wage effects  $\tau$  years after the passage of a family-leave policy along with the 95% confidence intervals, which are obtained via a bootstrap with 100 replications. Usage data suggests that men claim on average 26 hours of leave per year and women claim 49 (Brown et al., 2020). Brown et al. (2020) do not report the leave by race and gender, so we use the averages by gender, regardless of race. Negative values are wage costs to workers. White men are the only group who unambiguously benefit from the family-leave policies due to higher wages and the availability of family leave.

longer-time period of data, we are able to show that the earnings trajectories of white men and white women diverge in the long-run following the passage of family-leave policies. Ten years after the passage of family-leave, white men have higher annual earnings of about \$3,000 than the counterfactual without family-leave policies. By contrast, ten years after the passage of family-leave, white women have actual earnings that are statistically equal to the counterfactual without leave (*Estimated Value*).

## 8 Conclusion

We solve an important puzzle in economics: “why did gender wage convergence in the United States stall?” We offer a novel solution to the puzzle: the introduction of family-leave policies.

Using an event study design that leverages timing in the passage of state and federal

family-leave policies, we show that gender wage convergence stalls in states following the enactment of the policies. In fact, using the introduction of family-leave policies, we explain 84% of the stagnation in gender wage convergence that is unaccounted for after controlling for changes in observable characteristics between men and women. A key lesson from our work is that legally-mandated labor market flexibility can have the unintended effect of stymieing gender wage convergence, notwithstanding the increasing evidence that flexibility which arises endogenously in the labor market through technological innovation, and from firms changing their policies, can lead to reduced gender wage gaps (Cook et al. 2018a; Chen et al. 2019; Goldin 2014, 2021).

The evidence that we provide on the impact of leave policies on gender wage convergence in the US, joins a deep literature documenting negative impacts of leave policies on gender wage equality in Europe and other OECD countries (Mandel and Semyonov, 2005; Kleven et al., 2019; Patnaik, 2019; Ginja et al., 2020). Because the leave offered in the US is less generous than what is offered in peer countries, our results suggest an important role for economists to consider what features of family-leave policy design can soften the equity-efficiency trade-off arising from the introduction of family-leave policies. We leave this work to future studies by other scholars, having answered the question: “why did gender wage convergence in the United States stall?”

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## I Appendix: Additional Results

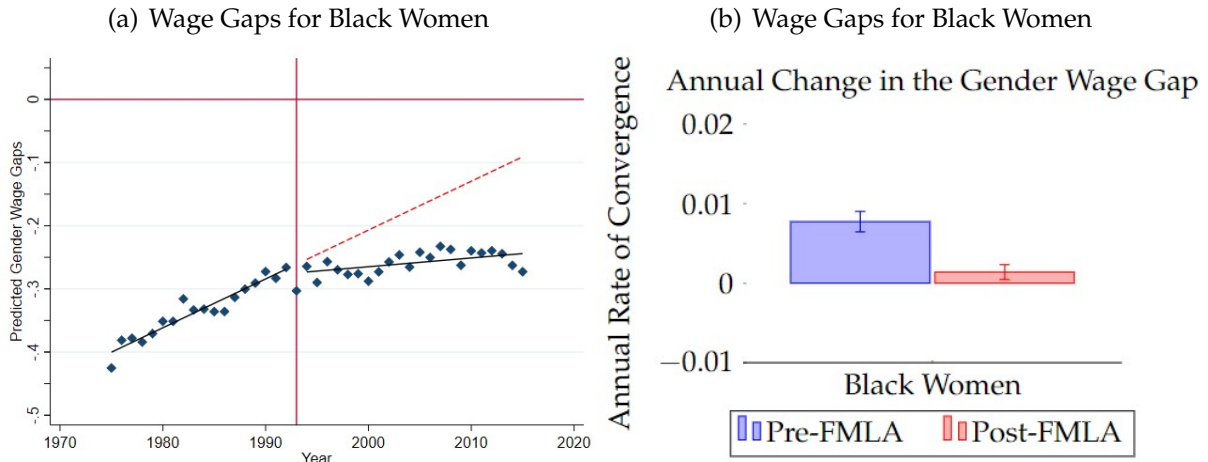
Table A1: Impact of FMLA on Trends in Gender Wage Convergence

	White Women	Black Women	Black Men
Trend	0.0097 (0.0004)	0.0077 (0.0006)	0.0008 (0.0006)
FMLA	-0.0203 (0.0061)	-0.0136 (0.0092)	0.0295 (0.0080)
Trend*FMLA	-0.0074 (0.0005)	-0.0063 (0.0008)	-0.0010 (0.0007)
Constant	-0.2348 (0.0045)	-0.2610 (0.0068)	-0.1390 (0.0060)
Rate of Convergence Post Period	0.0023 (0.0003)	0.0014 (0.0005)	-0.0002 (0.0004)
Observations	40	40	40
R-squared	0.9794	0.9267	0.7049

Standard errors in parentheses

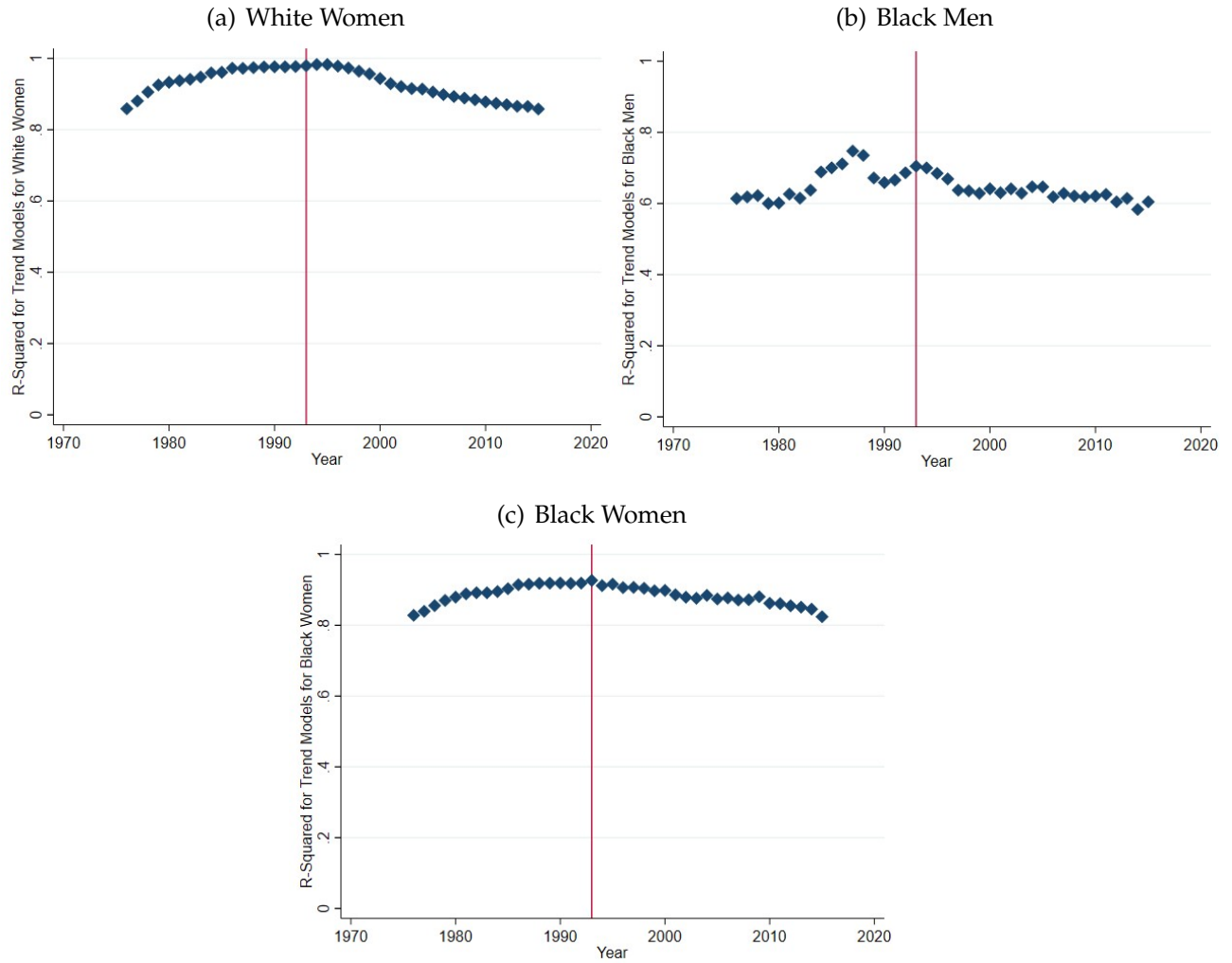
Regression of the estimate average wage gap on a piece-wise event-time trend that allows for a different slope and intercept following the FMLA. The model is run separately on the estimated wage gaps for white women, black men and black women and includes all years 1975-2015.

Figure A1: Estimated Trends in National Wage Gaps (1975–2015)



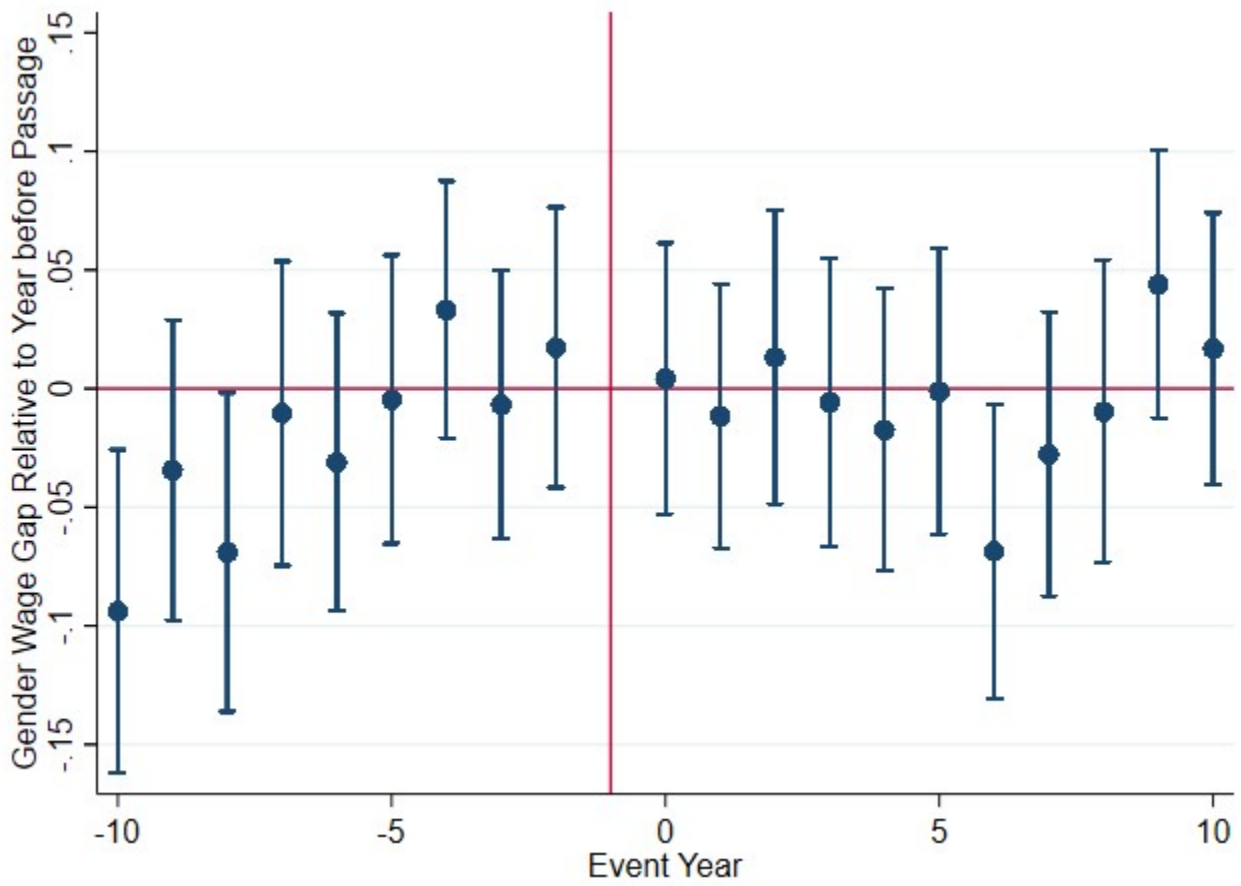
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. The figures above show the estimated wage gap between white men and black women (a). The trend rate prior to and after the passage of the FMLA are presented for black women in (b). This figure corresponds with Figure 2 in the paper.

Figure A2: Testing for Structural Break at FMLA Year (1993)



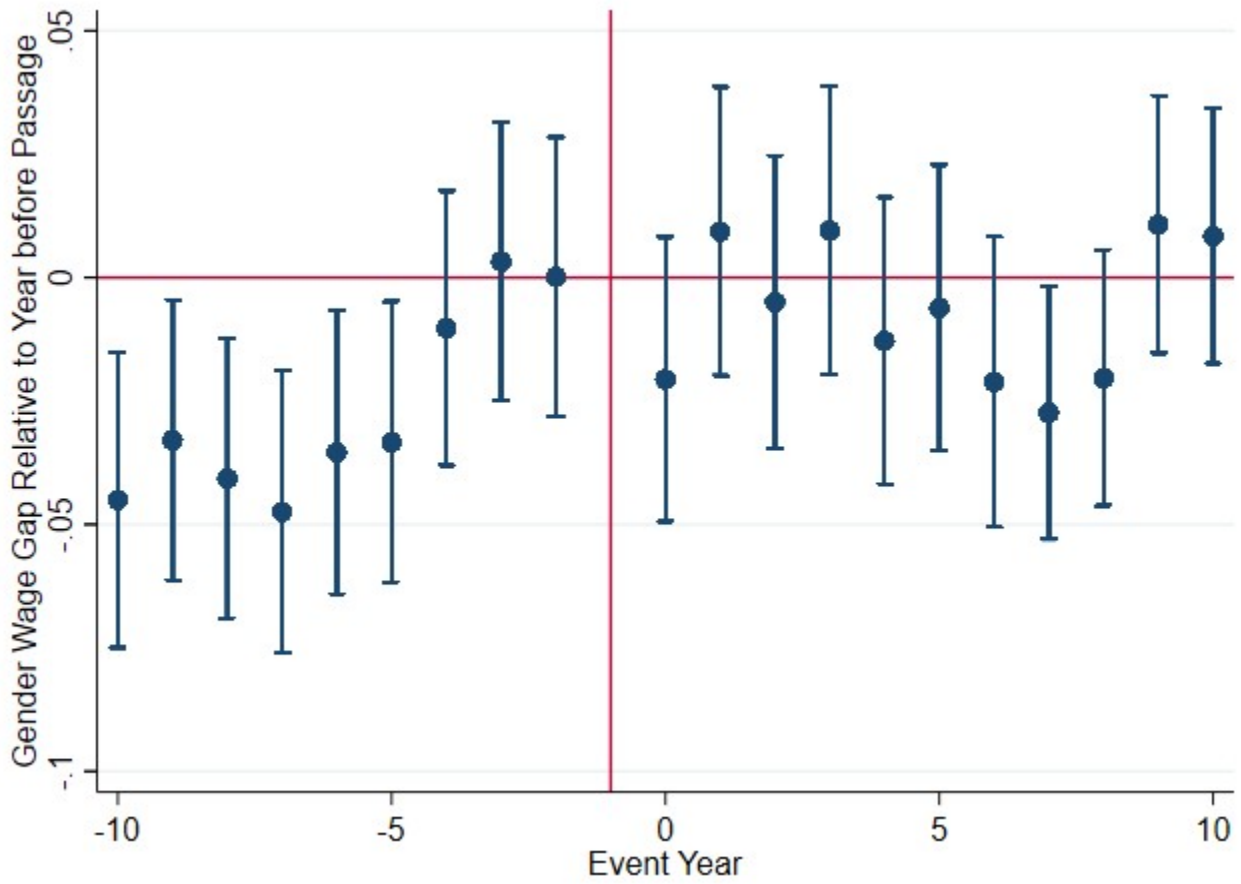
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS.

Figure A3: Event Study of Black Female Wage Gap Using State Variation



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. This figure corresponds with Figure 3 and Figure 4 in the paper.

Figure A4: Event Study of Black Female Wage Gap Using National Variation



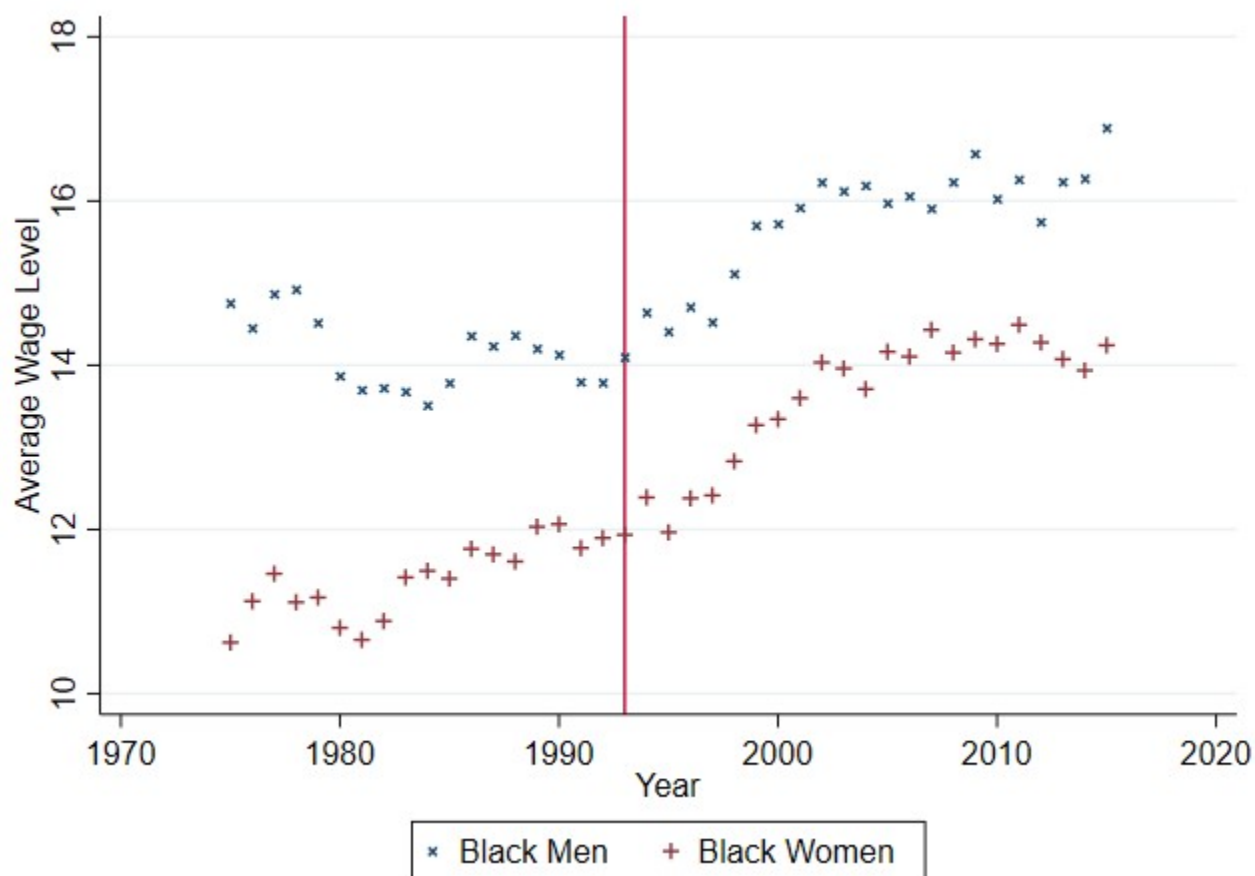
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. This figure corresponds with Figure 5 and Figure 6 in the paper.

Table A2: Blau and Kahn Decomposition (1979–1998)

Decomposition of Change 1979-1989	
Change in Differential	-0.1256
Observed Xs	-0.0376
Observed Prices	-0.0090
Gap Effect	-0.0946
Unobserved Prices	0.0156
Decomposition of Change 1989-1998	
Change in Differential	-0.0487
Observed Xs	-0.0360
Observed Prices	0.0361
Gap Effect	-0.0553
Unobserved Prices	0.0065

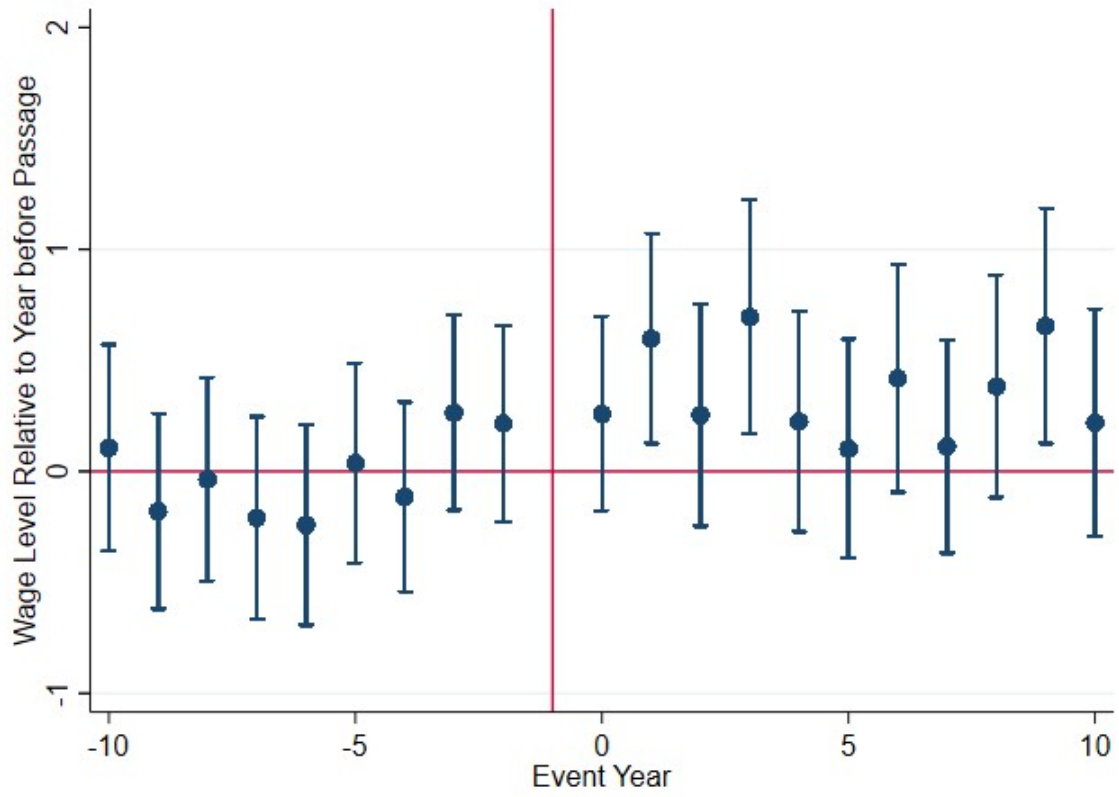
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. In this table we report a replication of the Blau and Kahn (2006) decomposition. Our decomposition closely mirrors the decomposition results from the original study for the CPS.

Figure A5: Average Wages (1975–2015)



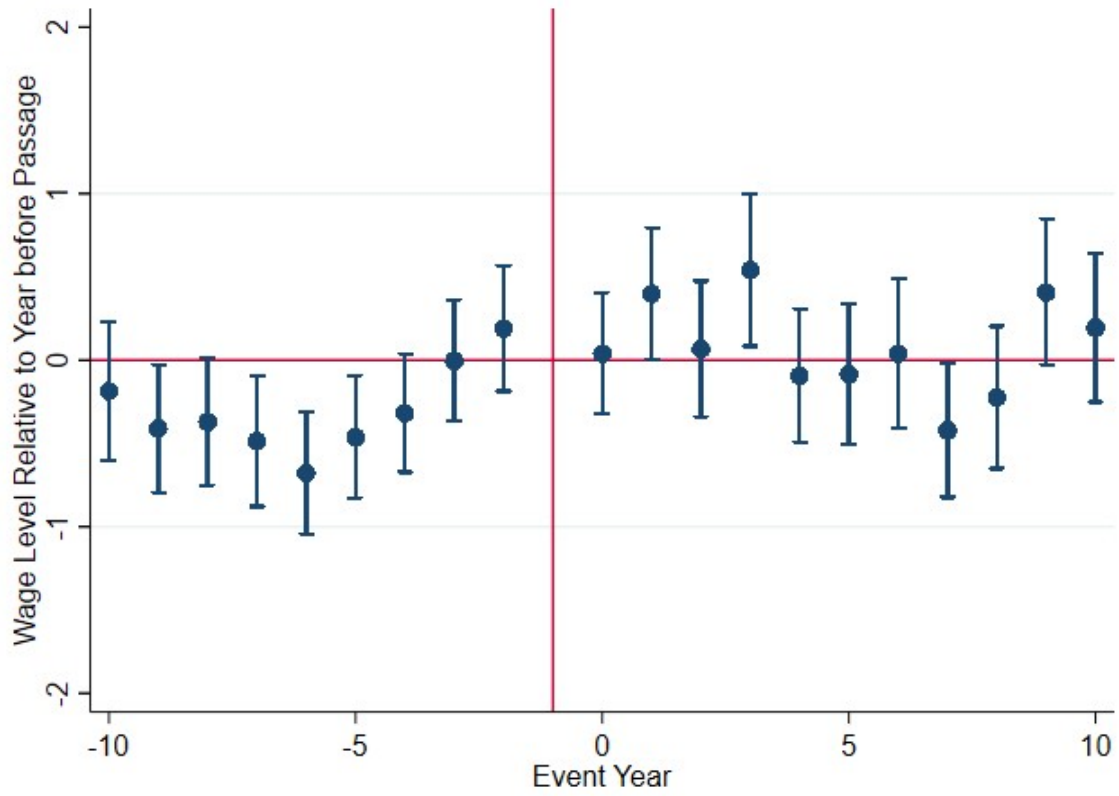
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. This figure corresponds with Figure 7 in the paper.

Figure A6: Event Study: Wage Levels for Black Men



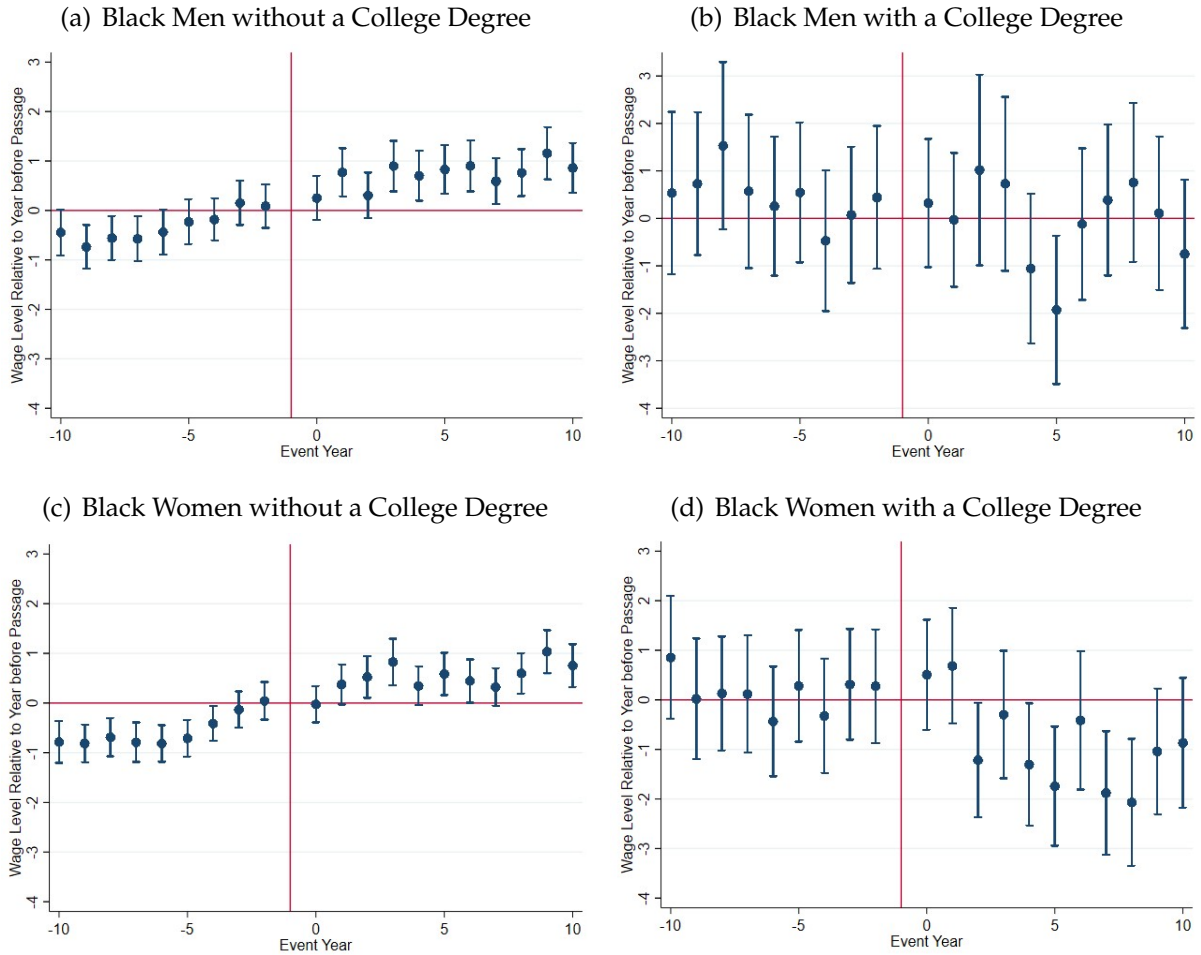
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. This figure corresponds with Figure 8 and Figure 9 in the paper.

Figure A7: Event Study: Wage Levels for Black Women



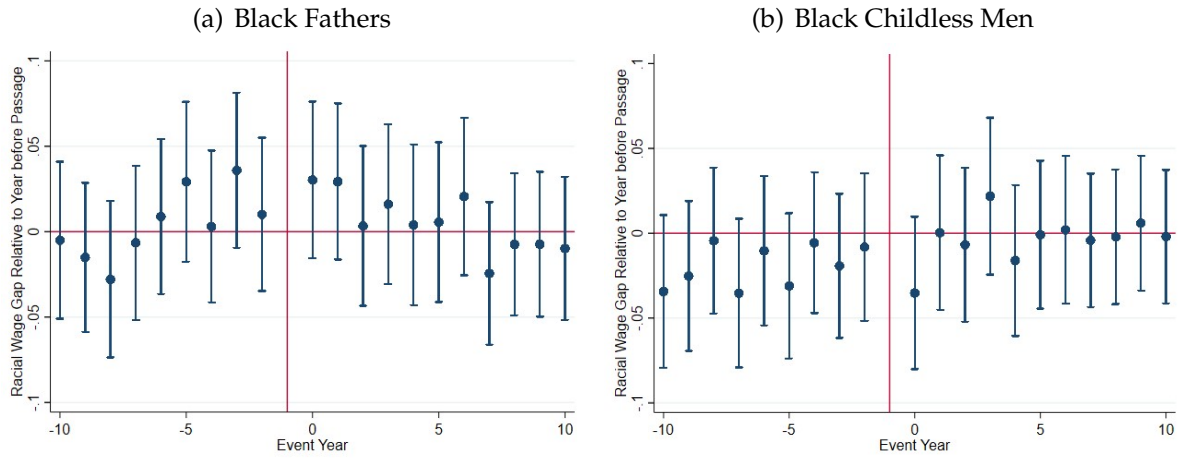
Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS. This figure corresponds with Figure 8 and Figure 9 in the paper.

Figure A8: Event Study: Wage Levels Based on Educational Attainment



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS and the National Bureau of Economic Research. The figure above shows the results of the event study on wage levels for white men and white women based on their educational attainment following the methodology of the event study in equation (3). The results are provided by the estimated coefficients  $\beta_{\tau} + \beta_{\tau,ww}$ . The figures correspond to Figure 10 in the paper.

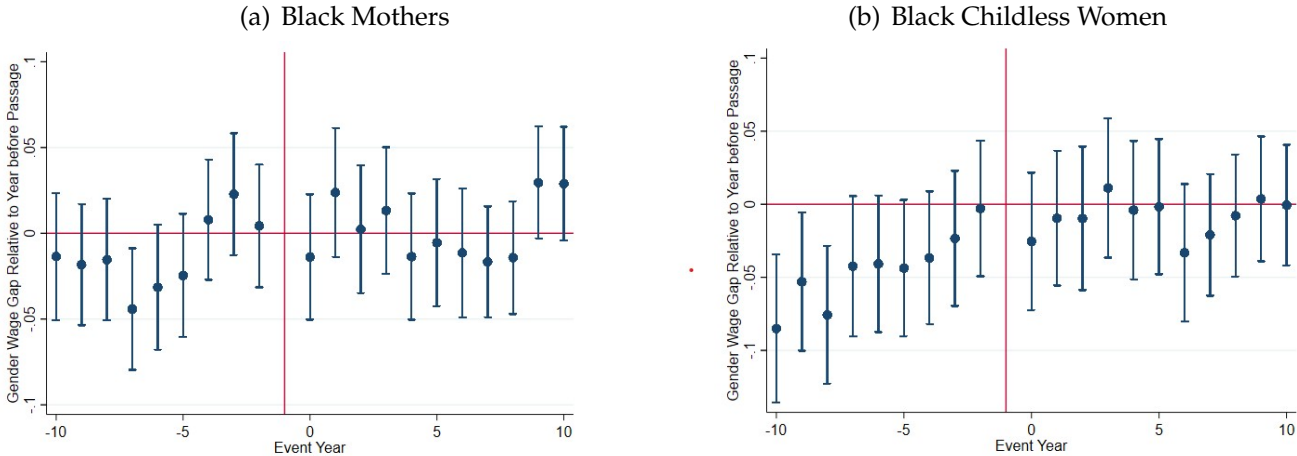
Figure A9: Event Study: Family Leave Policy on Racial Wage Gaps



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS

In the figure above, we have reported the results of event studies for convergence in wage gaps between white men and black women for workers with children (a) and workers without children (b). This figure corresponds with Figure 13 in the paper.

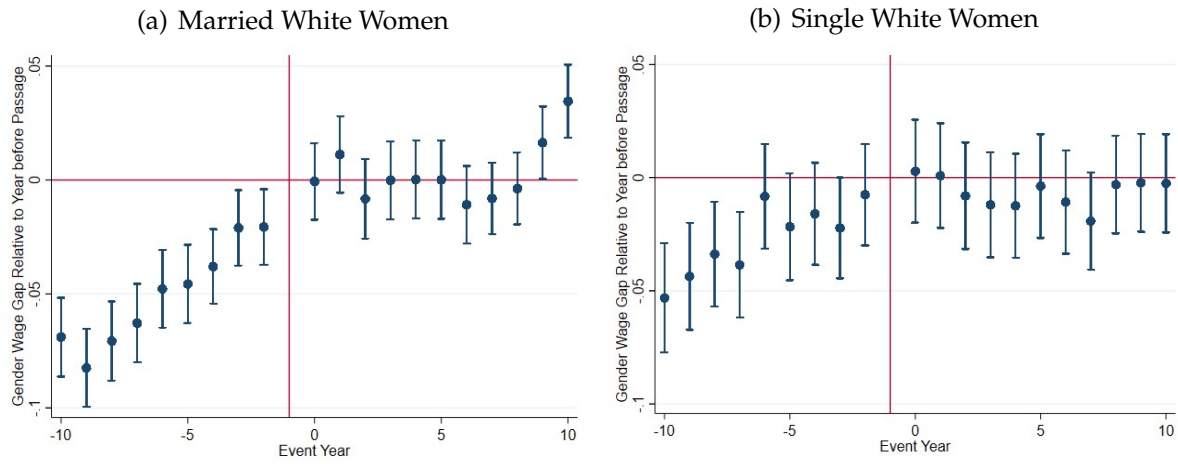
Figure A10: Event Study: Family Leave Policy on Gender Wage Gaps



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS

In the figure above, we have reported the results of event studies for convergence in wage gaps between white men and black women for workers with children (a) and workers without children (b). This figure corresponds with Figure 13 in the paper.

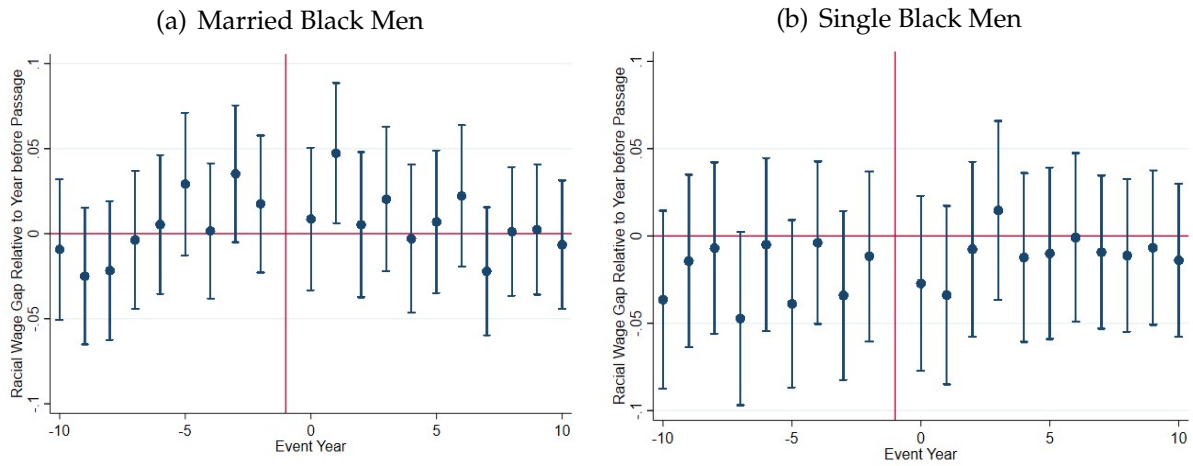
Figure A11: Event Study: Family Leave Policy on Racial Wage Gaps



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS

In the figure above, we have reported the results of event studies for convergence in wage gaps between white men and white women for married workers (a) and for single workers (b). This figure corresponds with Figure 12 in the paper.

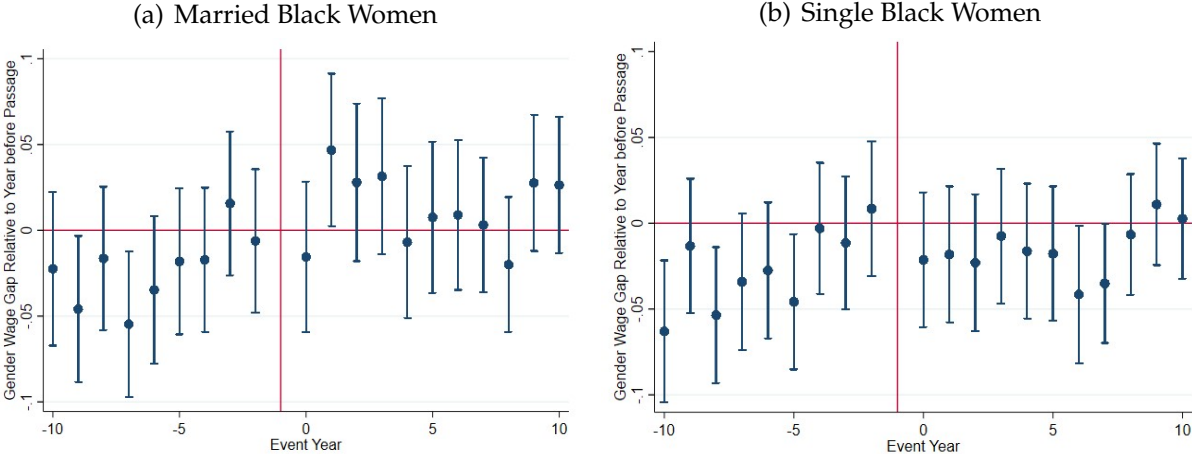
Figure A12: Event Study: Family Leave Policy on Racial Wage Gaps



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS

In the figure above, we have reported the results of event studies for convergence in wage gaps between white men and black men for married workers (a) and for single workers (b). This figure corresponds with Figure 12 in the paper.

Figure A13: Event Study: Family Leave Policy on Gender Wage Gaps



Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS  
In the figure above, we have reported the results of event studies for convergence in wage gaps between white men and black women for married workers (a) and for single workers (b). This figure corresponds with Figure 12 in the paper.

**Table A3: Annual Rate of Wage Convergence for White Women**

	Married	Single	Difference
Convergence Rate Before (p.p.)	0.804 (0.007)	0.527 (0.007)	0.278 (0.010)
Drop in Convergence Rates (p.p.)	0.557 (0.010)	0.424 (0.010)	0.133 (0.014)
Convergence Rate After (p.p.)	0.247 (0.007)	0.102 (0.008)	0.145 (0.011)

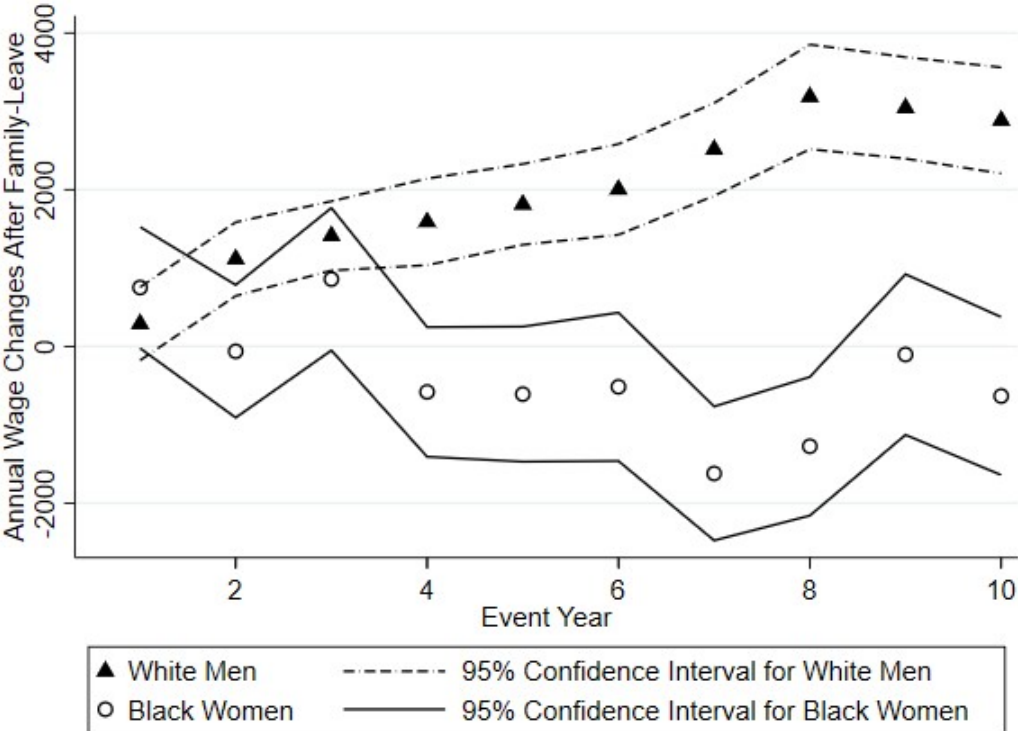
**Gender Wage Gap at Passage**

Bootstrap standard errors in parentheses

*Source: Annual Social and Economic Supplement of the Current Population Survey available through IPUMS.*

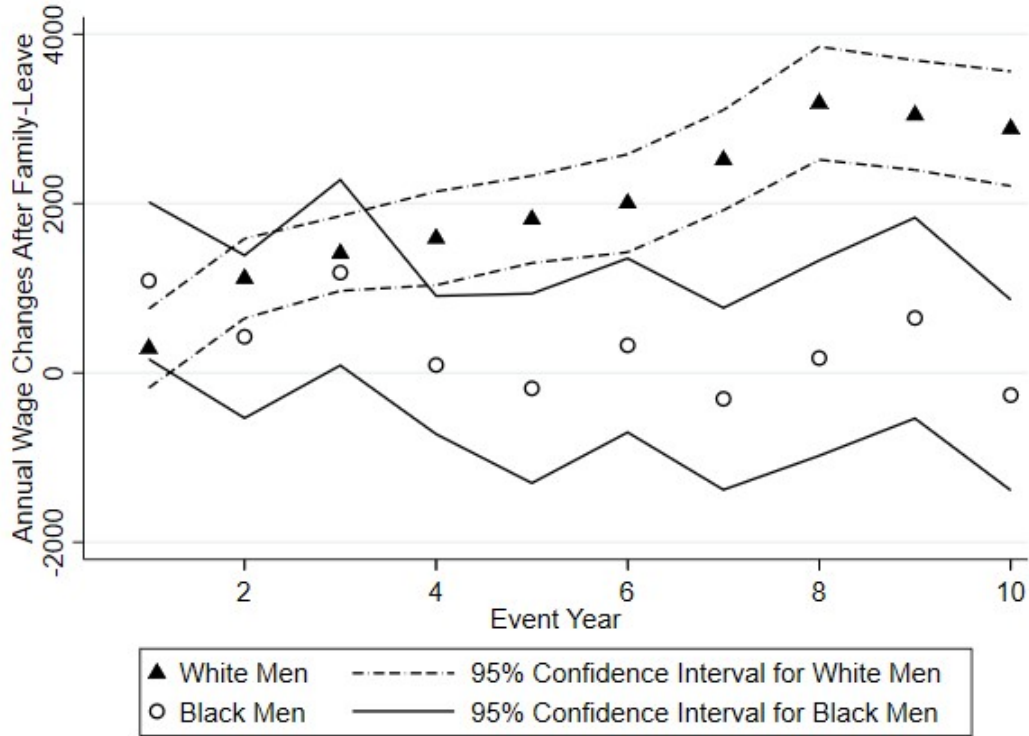
In the table above, we report the convergence rates in wages before and after the passage of family-leave policies for different groups of workers. The results are obtained by estimating Equation (4) on the point estimates displayed in Figures 11 using a bootstrap over  $n = 100$  replications.

Figure A14: Back of the Envelope Calculation Results for Black Women



In the figure above, we have reported the results of a back of the envelope calculation for annual wage effects  $\tau$  years after the passage of a family-leave policy along with the 95% confidence intervals, which are obtained via a bootstrap with 100 replications. Usage data suggests that men claim on average 26 hours of leave per year and women claim 49 (Brown et al., 2020). Brown et al. (2020) do not report the leave by race and gender, so we use the averages by gender, regardless of race. Negative values are wage costs to workers. Neither black men nor black women experience a consistently higher or lower wage due to family-leave policies.

Figure A15: Back of the Envelope Calculation Results for Black Men



In the figure above, we have reported the results of a back of the envelope calculation for annual wage effects  $\tau$  years after the passage of a family-leave policy along with the 95% confidence intervals, which are obtained via a bootstrap with 100 replications. Usage data suggests that men claim on average 26 hours of leave per year and women claim 49 (Brown et al., 2020). Brown et al. (2020) do not report the leave by race and gender, so we use the averages by gender, regardless of race. Negative values are wage costs to workers. Neither black men nor black women experience a consistently higher or lower wage due to family-leave policies.